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Limnological Monitoring on the Upper Mississippi River System, 1993–1996: Lake City Field Station

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by

David M. Soballe, Robert Burdis, and Walt Popp

October 1999

U.S. Geological Survey
Upper Midwest Environmental Sciences Center
2630 Fanta Reed Road
La Crosse, Wisconsin 54603

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Preface

The Long Term Resource Monitoring Program (LTRMP) was authorized under the Water Resources Development Act of 1986 (Public Law 99-662) as an element of the U.S. Army Corps of Engineers' Environmental Management Program. The LTRMP is being implemented by the Upper Midwest Environmental Sciences Center (formerly Environmental Management Technical Center), a U.S. Geological Survey science center, in cooperation with the five Upper Mississippi River System (UMRS) States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin. The U.S. Army Corps of Engineers provides guidance and has overall Program responsibility. The mode of operation and respective roles of the agencies are outlined in a 1988 Memorandum of Agreement.

The UMRS encompasses the commercially navigable reaches of the Upper Mississippi River, as well as the Illinois River and navigable portions of the Kaskaskia, Black, St. Croix, and Minnesota Rivers. Congress has declared the UMRS to be both a nationally significant ecosystem and a nationally significant commercial navigation system. The mission of the LTRMP is to provide decision makers with information for maintaining the UMRS as a sustainable large river ecosystem given its multiple-use character. The long-term goals of the Program are to understand the system, determine resource trends and effects, develop management alternatives, manage information, and develop useful products.

In this report, limnological monitoring conducted by the LTRMP Lake City Field Station from 1993 to 1996 is summarized. Reports of this type provide a synopsis of the collected data and collection methods, as well as a preliminary report of remarkable or unusual conditions in the system. They are intended to be produced annually.

This report was prepared under Task 2.2.3.6, *Evaluate and Summarize Current Monitoring Results*, of the Operating Plan (U.S. Fish and Wildlife Service 1993). This report was developed with funding provided by the LTRMP.

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David M. Soballe

U.S. Geological Survey
Upper Midwest Environmental Sciences Center
2630 Fanta Reed Road
La Crosse, Wisconsin 54603

Robert Burdis and Walt Popp

Minnesota Department of Natural Resources
LTRMP Lake City Field Station
1801 South Oak Street
Lake City, Minnesota 55041

Abstract: Since 1988, the Long Term Resource Monitoring Program (LTRMP) staff have performed basic limnological field measurements in the Upper Mississippi River System. The period of this report (1993–96) includes a major revision of the LTRMP sampling design in 1993 that added randomization, broader spatial coverage, and increased monitoring of tributaries and locations that allow monitoring of material transport. Monitoring by the Lake City (Minnesota) Field Station reported here shows water quality differences among the tributaries to Pools 4 and 5, spatial and temporal patterns within these pools, and the sediment and nutrient trapping effects of Lake Pepin, a natural impoundment of the Mississippi River.

Keywords: Annual report, limnology, LTRMP, Mississippi River, water quality

Introduction

The Upper Mississippi River is a major resource of multiple uses that include navigation, water supply, hydroelectric generation, fish and wildlife habitat, and recreation. Effective management of this resource requires scientific understanding of the ecosystem and of its long-term trends and conditions. To meet this need, Congress authorized a Long Term Resource Monitoring Program (LTRMP) for the Upper Mississippi River System (UMRS). The LTRMP, begun in 1988, is intended to provide scientifically sound and useful information by using consistent and reliable methods to monitor and evaluate long-term changes in selected physical, chemical, and biological characteristics.

The LTRMP water quality staff collects basic information on selected physical and chemical features of the UMRS to aid in the interpretation or prediction of long- and short-term patterns. The data focus on a subset of limnological variables (i.e., physicochemical features, suspended sediment, and major plant nutrients) known to be significant to aquatic habitat in this system. The LTRMP is designed to complement, not replace or duplicate, the monitoring programs of other state and Federal agencies. It therefore includes some limnological characteristics not routinely monitored in water quality programs and it excludes others that are of concern primarily for human consumption or regulatory purposes (e.g., chemical oxygen demand, biochemical oxygen demand, total coliform bacteria, fecal coliform bacteria, fecal streptococcus, heavy metals, pesticides, and polychlorinated biphenyls).

The present report is one in a series summarizing limnological monitoring at each of the LTRMP field stations. This report is intended to (1) document those aspects of sample collection (e.g., sampling times, period of record, sample locations, and allocations among strata) needed for valid interpretation of the data, and (2) report limnological conditions. Detailed analyses and interpretation of the limnological data are reported separately. This report, the first of this specific series, covers multiple years.

To improve readability and increase the usefulness of this document as a reference, the numerous graphic and tabular summaries are included as appendixes. These appendixes are referenced extensively in the main body of the report, and each appendix contains explanatory information that allows it to be used as a nearly independent document.

The data presented here represent a concerted effort by personnel of the Minnesota Department of Natural Resources and the U.S. Geological Survey who collected, compiled, verified, and organized the data. The specific data used in this report have been archived at the Upper Midwest Environmental Sciences Center (UMESC; formerly Environmental Management Technical Center), La Crosse, Wisconsin, and are available on request. This archival step isolates these data from the dynamics (additions and corrections) of the main LTRMP database and thus facilitates the reexamination, reconstruction, or expansion of the results presented here.

The Upper Mississippi River System

The basin of the UMRS (about 490,000 km^2) extends from north-central Minnesota to the Ohio River confluence near Cairo, Illinois. The enabling authorization for the LTRMP, however, restricts monitoring to the geological floodplain (about 2% of the total drainage). The LTRMP study areas include selected sections of the Mississippi River (Navigation Pools 4, 8, 13, and 26), the La Grange Pool of the Illinois River, and the open river reach (Middle Mississippi) between the Missouri River and Ohio River confluences (Figure 1).

Field teams of the LTRMP monitor more than 2,000 km of large river; across this expanse there exist distinct differences in climate, geomorphology, surficial geology, and land use. Patterns that arise from the north–south orientation of the system are overlain by upstream to downstream changes related to river size (Vannote et al. 1980). Consequently, the areas monitored by individual field stations differ markedly in the distribution and characteristics of aquatic habitat and aquatic biota. The LTRMP monitoring design must contend with these differences by being flexible enough to accommodate local conditions but appropriately uniform across all study areas to permit comparison and synthesis.

Dam construction on the Upper Mississippi and Illinois Rivers has profoundly altered these rivers, creating a series of rapidly flushed impoundments connected by short stretches of flowing river that are influenced by dam operations (Figure 2).

The dams on the main stem of the Upper Mississippi River are numbered from upstream to downstream (starting near St. Paul, Minnesota) and the river reach above each dam is called a pool (Table 1a). The pool has the same numeric designation as the downstream dam. For example, Pool 14, near Clinton, Iowa, includes the entire reach of river upstream of Lock and Dam 14 and downstream of Lock and Dam 13. A similar system is used on the Illinois River, but the individual dams are named rather than numbered (Table 1b). Although the navigation dams have created significant zones of permanent inundation in Pools 1–13 of the Upper Mississippi River, these zones are usually less than half the total water surface within the pool (LTRMP aquatic areas database) and are semifluvial (average hydraulic residence times <2 days).

Between Pools 13 and 26 in the Mississippi River and in most of the Illinois River, the navigation dams have deepened the river and widened it slightly, but have permanently inundated little terrestrial area compared with major river impoundments and have created minimal lake-like habitat. The term pool is therefore misleading inasmuch as it suggests that the UMRS is a stair-step series of lake-like impoundments. Nonetheless, the term is used widely and recognized by those familiar with the UMRS and is used freely in this report.

Figure 1. The Long Term Resource Monitoring Program (LTRMP) study area. Although the Missouri River is shown for reference, only the mouth of this tributary is sampled for water quality under the LTRMP.

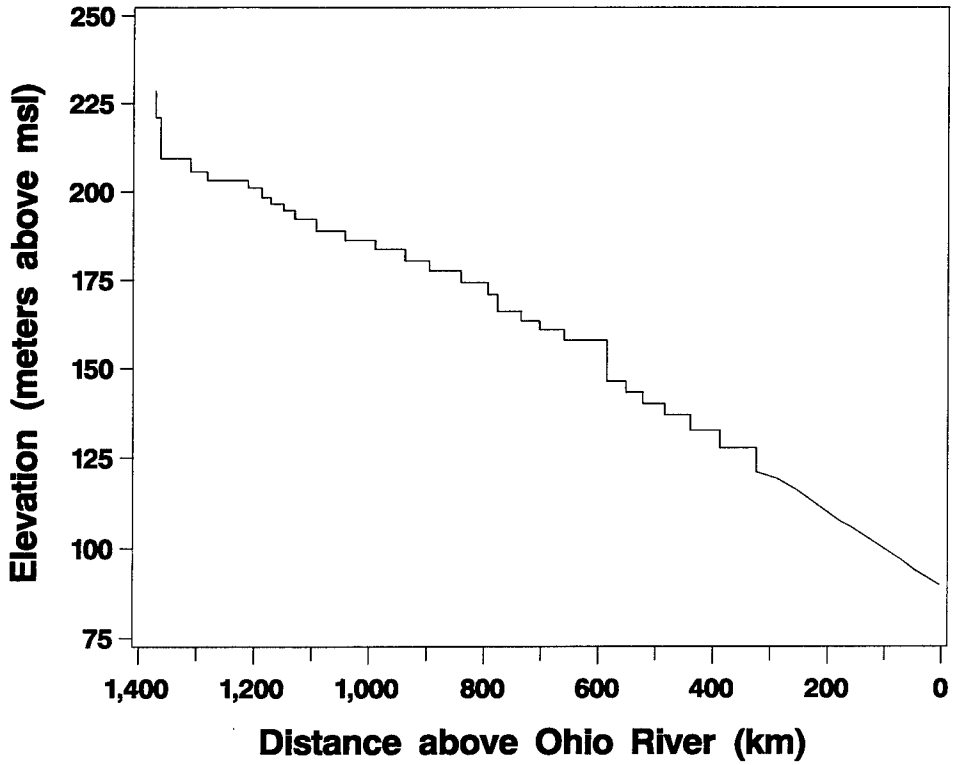

Figure 2. Water surface elevation (meters above mean sea level [msl]) of the Mississippi River from the head of navigation near St. Paul, Minnesota, to the confluence of the Ohio River near Cairo, Illinois.

The first major dam on the Upper Mississippi River was constructed in 1913 near Keokuk, Iowa, and was followed by 27 additional dams on the main stem to create a 2.7-m (9-foot) navigational waterway from Alton, Illinois, to St. Anthony Falls near St. Paul, Minnesota. Twenty-two dams were built between 1935 and 1940; the last dam was completed in 1958 at Lower St. Anthony Falls near Minneapolis (Table 1a). The navigation system was altered significantly in 1993 when Lock and Dam 26 at Alton was replaced by a new structure (Melvin Price Lock and Dam) with increased lock capacity about 1.6 km (1 mile) farther downstream. The previous Lock and Dam 26 was removed after the new structure was completed.

The history of impoundment on the Illinois River is similar to that of the Upper Mississippi River, and the Illinois River is now divided into six navigational pools (Table 1b). The first dams were completed on the upper portions of the Illinois River (Starved Rock, Marseilles, and Dresden Island) in 1933; additional dams at Peoria and La Grange were completed in 1938. The Melvin Price dam on the Mississippi River near Alton, Illinois, also impounds the lowermost portion of the Illinois River.

Table 1a. Dams on the Upper Mississippi River.

Name of dam	Date placed in service	City[a]	River mile	Drainage area (km^2)	Dam height (m)	Pool elevation (feet)
Lower St. Anthony Falls	11/13/58	Minneapolis, Minn.	853.2	51,000	7.3	750.0
1	07/03/17	St. Paul, Minn.	847.6	51,000	11.3	725.1
2	07/01/31	Hastings, Minn.	815.2	96,000	3.7	687.2
3	07/21/38	Red Wing, Minn.	796.9	117,000	3.7	675.0
4	05/25/35	Alma, Wis.	752.8	148,000	2.4	667.0
5	05/29/35	Minneiska, Minn.	738.1	152,000	2.1	660.0
5a	07/06/36	Winona, Minn.	728.5	153,000	2.7	651.0
6	06/30/36	Trempealeau, Wis.	714.3	155,000	1.7	645.0
7	04/19/37	Dresbach, Minn.	702.5	161,000	2.0	639.0
8	04/26/37	Genoa, Wis.	679.2	168,000	2.4	631.0
9	07/08/37	Lynxville, Wis.	647.9	172,000	3.4	620.0
10	11/26/37	Guttenberg, Iowa	615.1	206,000	2.7	611.0
11	09/14/37	Dubuque, Iowa	583.0	211,000	2.4	603.0
12	05/14/39	Bellevue, Iowa	556.7	213,000	3.4	592.0
13	05/13/39	Clinton, Iowa	522.5	221,000	2.7	583.0
14	06/14/39	Le Claire, Iowa	493.3	229,000	3.3	571.9
15	03/07/34	Rock Island, Ill.	482.9	229,000	4.9	561.0
16	07/10/37	Muscatine, Iowa	457.2	257,000	2.7	545.0
17	05/14/39	New Boston, Ill.	437.1	258,000	2.4	536.0
18	09/08/37	Burlington, Iowa	410.5	294,000	3.0	528.0
19	06/12/13	Keokuk, Iowa	364.2	308,000	11.6	518.2
20	06/09/36	Canton, Mo.	343.2	348,000	3.0	480.4
21	07/21/38	Quincy, Ill.	324.9	348,000	3.2	470.0
22	07/22/38	Saverton, Mo.	301.2	356,000	3.1	459.5
23[b]	—	—	—	—	—	—
24	1940	Clarksville, Mo.	273.4	365,000	4.6	449.2
25	05/18/39	Cap Au Gris, Mo.	241.4	368,000	4.6	434.9
26[c]	05/01/38	Alton, Ill.	202.9	443,000	6.7	419.0
Melvin Price	1990–1994	Alton, Ill.	200.8	444,000	7.3	419.0

[a] State abbreviations, Minn. = Minnesota, Wis. = Wisconsin, Ill. = Illinois, Mo. = Missouri
[b] Lock and Dam 23 was never built.
[c] Lock and Dam 26 was removed after the Melvin Price Dam was placed in service.

Table 1b. Dams on the Illinois River.

Name of dam	Date placed in service	River mile	Drainage area (km^2)	Dam height (m)	Pool elevation (feet)
Thomas J. O'Brien[a]	1960	326.5	0	1.2	583.5
Lockport	1933	291.1	1,900	12.3	579.5
Brandon Road	1933	286.0	3,900	10.4	539.0
Dresden Island	1933	271.5	18,800	6.7	505.0
Marseilles	1933	247.0	21,400	7.3	483.0
Starved Rock	1933	231.0	28,600	5.8	459.0
Peoria	1938	157.7	37,700	3.4	440.0
La Grange	1939	80.2	66,400	2.9	429.0

[a] This structure controls diversion discharge into the Illinois waterway from outside the drainage basin (Lake Michigan)

Methods

Study Area

The study area of the LTRMP includes the Mississippi River from Cairo, Illinois, to the head of navigation near St. Paul, Minnesota; the Illinois River; and navigable portions of the Kaskaskia, Black, and St. Croix Rivers. In recognition of the highly variable and widely differing river characteristics within this large study area, the Comprehensive Master Plan (Jackson et al. 1981) recommended 17 pools or reaches for detailed monitoring. Available resources, however, have limited the LTRMP to six selected areas, and the five states bordering the Upper Mississippi River now operate six LTRMP monitoring stations that focus on these specific reaches. These areas (Figure 1) are concentrated in the uppermost segments of the Mississippi River. The river sections presently monitored under LTRMP for water quality include Pools 4, 8, 9, 12, 13, 14, and 26 in the impounded portion of the Upper Mississippi River, 80 miles of the open river above the Ohio River confluence at Cairo, Illinois, and the La Grange Pool of the Illinois River. All of the major tributaries of the Mississippi and Illinois River in these river segments are monitored under the LTRMP. The long (400 km) reach of the Upper Mississippi River between Pools 14 and 26 is not monitored under the LTRMP, but other state and Federal programs collect water quality information in this reach and adjoining tributaries (i.e., Iowa-Cedar, Rock, and Des Moines Rivers).

In the nonbraided portion of the Upper Mississippi River main stem (between Pools 14 and 26), sampling under the LTRMP is limited to the extreme upstream and downstream ends. However, the river main stem and its tributaries in this reach are monitored by other Federal and state programs.

Personnel from the Minnesota Department of Natural Resources, Lake City Field Station, conduct LTRMP monitoring on Pools 4 and 5, defined by Lock and Dam 3 at Mississippi River mile 796.9, Lock and Dam 4 at Mississippi River mile 752.8, and Lock and Dam 5 at Mississippi River mile 738.2 (Appendixes A and B). Water quality has been monitored on Pool 4 since 1990 and on Pool 5 since 1993 (Appendixes A and B).

The total water surface area of Pool 4 (between Lock and Dam 3 and Lock and Dam 4) is about 15,000 ha, with about 3,100 ha of backwater and 1,200 ha of main channel. The total water surface area of Pool 5

(between Lock and Dam 4 and Lock and Dam 5) is about 4,500 ha, with about 3,000 ha of backwater and impoundment and 900 ha of main channel.

In this uppermost study reach of the LTRMP, deltaic deposits from the Chippewa River have partly obstructed the flow of the Mississippi River and formed Lake Pepin, a large (9,800 ha), tributary delta lake (Hutchinson 1975) that resembles an artificial riverine impoundment. Lake Pepin is a highly efficient sediment trap that dramatically alters water quality in the Mississippi River, both within Lake Pepin itself and for a considerable distance downstream.

Increased water retention time in Lake Pepin during periods of low flow, combined with high concentrations of nutrients, promotes blue-green algal blooms during periods of hot, calm weather. Fish kills have been observed during such periods. In summer, Lake Pepin typically is a net source of soluble reactive phosphorus, the most readily available form of phosphorus for algae and vascular plants.

Lake Pepin has received considerable attention in the past several years because of severe nuisance algal blooms and fish kills that occurred during low flow in 1988. Agencies are investigating the origin and extent of both internal and external phosphorus loading in Lake Pepin and the potential effects on water quality if external loading is reduced. The Lake City field station has participated in these efforts by assisting with water quality sampling and providing LTRMP data to the agencies involved.

The drainage area of Pools 4 and 5 comprise large portions of the States of Minnesota and Wisconsin. Two major tributaries, the Minnesota and St. Croix Rivers, combine with the Mississippi River near the Twin Cities metropolitan area and account for the majority of discharge that enters Pool 4. These rivers have distinct water quality characteristics because of differences in geology and land use cover in their watersheds. Consequently, the relative discharge in these three rivers can have a great effect on the water quality in Pool 4.

The Chippewa River enters Pool 4 at the downstream end of Lake Pepin and its distinctive water quality characteristics influence the Mississippi River in large areas of lower Pools 4 and 5.

Monitoring Network and Sampling Design

The LTRMP was begun in 1988; field stations were added to the network from 1988 to 1991 (Table 2). This staggered start is significant when making comparisons among study areas or assessing overall trends across the system. Limnological monitoring during the first years (1988–91) was limited to fixed sites and to in situ physical and chemical measurements. The present LTRMP sampling design (implemented in June 1993) includes both fixed-site (Appendix A) and stratified random sampling (SRS; Appendix B) and combines in situ field measurements with laboratory analyses of chemical constituents (Appendix C).

Fixed-site sampling in the present design monitors inflows (tributaries and dam releases) and outflows from each of the LTRMP study areas. Secondarily, fixed sites are used to monitor locations of special significance, either because of their long data record or some other feature that makes them notable or especially interesting. Each LTRMP field station monitors 15–30 fixed sites biweekly with no attempt to capture or avoid high or low flows (Appendix A).

Table 2. Period of operation for each of the Long Term Resource Monitoring Program field stations.

Field station	1988	1989	1990	1991	1992–1996
Lake City			Jan		
Onalaska	Jul				
Bellevue	Aug				
Alton	Jul				
Cape Girardeau				Mar	
Havana		Sept			

From 1988 to 1993, the LTRMP used 24 aquatic habitat classes (Appendix A) to describe the permanently fixed monitoring sites. Some of these classes included a seasonally varying attribute (aquatic vegetation) as part of their definition, and the classes were not mutually exclusive. For example, a site in midchannel downstream of a dam might be classified as "Main Channel" (MC), "Channel Trough" (CTR), "Open Tailwater" (TWR-O), or "Tailwater" (TW). This classification scheme was revised in 1993 when vegetation status was dropped from the habitat designators and those categories that were viewed as redundant or not distinguishable by routine water quality measurements were eliminated. The revised system contains seven habitat classes (Table A-4), and all previous habitat classifications for fixed sites were converted to this system. The original designations for all fixed sites are permanently on file at UMESC and at the individual field stations.

As with the six field stations, the period of record differs among individual fixed sites. When the emphasis of fixed-site sampling shifted to tributaries and other transport monitoring points in 1993, sites were added and eliminated from the sampling network in each study reach. At the same time, sampling frequency at fixed sites was reduced from weekly to biweekly (Figure A-2) to keep the overall level of monitoring constant despite the addition of SRS.

The habitat class associated with each fixed site provides useful ancillary information about the site and a convenient way to retrieve data from the LTRMP database. However, LTRMP fixed-site data cannot be used generally to make inferences about these habitat classes because fixed sites were chosen subjectively and without randomization and represent only specific locations. Although the sampling sites can be grouped by their habitat categories, the resultant groupings are not unbiased samples of these categories. To overcome this limitation, the monitoring design was modified in 1993 to include SRS and thus provide unbiased information about broad spatial areas.

The LTRMP design for fixed-site sampling requires that each day's sampling effort be centered on noon, central standard time, and that the order of site visits within each sampling day be randomized to the extent feasible within operational constraints. The sampling times were formally established in September 1993.

The SRS complements the fixed-site design and provides a seasonal assessment of known precision and confidence on limnological conditions in broad sampling strata in the LTRMP study areas. Limnological data from SRS are intended to be linked to patterns in fish, vegetation, and invertebrates at the spatial scale of a whole navigational pool or river reach and at temporal scales ranging from seasons to decades. The SRS data can be interpreted confidently at these scales of space and time. Higher resolution questions (e.g., short-term movements or locations of fish, growth dynamics within individual aquatic plant beds) are outside the realm

of routine monitoring as defined by the LTRMP and are not addressed by SRS or fixed-site sampling in the LTRMP monitoring design.

The SRS is performed in four quarterly episodes each year (Appendix B). Each SRS episode includes about 135 sites selected from six sampling strata and is generally completed within 14 days (Appendix B). The sampling strata are condensed from the geomorphic "aquatic areas" of Wilcox (1993) and are objectively defined in a geographic information system (Owens and Ruhser 1996). Specific sampling points for each sampling episode are selected by overlaying a square grid with 200-m spacing on a map of the sampling strata. Grid intersections are randomly selected for each sampling episode. Beginning in spring 1995, a 50-m grid was used for side channel and backwater strata. A smaller grid spacing was deemed appropriate to the spatially diverse conditions within these strata (i.e., points 50 m apart are likely to be very different); this increases the number of potential sites available for site selection. Although the number of sites selected was not altered by this change in grid spacing, the number of locations resampled in subsequent episodes was greatly reduced. The allocation of samples among strata emphasizes off-channel areas and is not proportional to the surface area of the strata (Appendix B). Data from the strata must be weighted to obtain accurate poolwide or reachwide estimates, and this weighting must account for the areas of the strata, the differing grid intervals among the strata, changes to the grid in 1995, and the allocation of sampling effort (Appendix B).

The LTRMP design for SRS requires that each day's sampling be centered on noon, central standard time, and that the order of site visits within each sampling day be randomized to the extent feasible within operational constraints. This specification for sampling times was formally established in September 1993.

The sampling strata used by the LTRMP are primarily a statistical tool that allows the spatial allocation of sampling effort to match differences in desired precision and variability among the strata. An exact correspondence between sampling strata and the aquatic areas of Wilcox (1993) is not attainable and is not required by the LTRMP statistical design. The data from a sampling stratum, therefore, should not be regarded as precisely representing a specific aquatic area type.

Because the river is dynamic, the borders of the aquatic areas change over time, but the sampling strata boundaries have been (with minor exceptions) static since their original designation in 1993. Thus the aquatic areas are expected to gradually diverge from the sampling strata because of long-term changes in river morphology. In addition, short-term fluctuations in water level can make sites unusable or atypical of their parent stratum. The field teams use data comments to report sites that cannot be sampled or seem to be outside their designated sampling stratum. These comments are extremely valuable for data interpretation and also give a rough indication of the rate or extent of divergence between the sampling strata and the aquatic areas. However, field comments lack the spatial intensity and consistency required to track or map changes in stratum boundaries, and the LTRMP staff intends to track changes in aquatic areas by systemwide remapping and reclassification of areas at regular (e.g., 10-year) intervals. If future remapping results in new sampling strata, all sampling locations will have both pre- and postrevision stratum codes assigned. This will allow analysis for the full period of monitoring to be based on either mapping scheme.

The capacity of the LTRMP analytical laboratory has restricted the number of chemical measurements performed on SRS samples. Consequently, from 1993 to 1996, SRS has included major plant nutrients, suspended solids, and phytopigments, but has excluded major cations (sodium, magnesium, calcium, potassium) and major anions (chloride and sulfate). In situ measurements are made at all SRS sites, but to reduce the laboratory sample load, only in a randomly selected subset of sites (about half) are samples collected for a full complement of laboratory analyses. Significant improvements in laboratory performance in 1997 may reduce these limitations in future years.

Sample Collection

The LTRMP limnological monitoring includes measurements at multiple depths (Soballe et al. 1999). About 80% of LTRMP measurements from 1993 to 1996 were taken near the water surface (0.0 to 0.20 m); laboratory analyses during this period were performed only on near-surface and near-bottom samples. The LTRMP sampling for water quality is generally restricted to waters with maximum depth equal to or greater than 0.2 m. However, samples are occasionally collected in shallower waters, particularly under ice cover, when this can be done without disturbing the substrate. Discrete, rather than integrated, samples are collected and analyzed. Grabs for chemical analysis are taken with either a bucket (near surface) or a Van Dorn-type sampler (at depth).

When the sampling design was revised in 1993, grab-sampling techniques remained unchanged; however, individual instruments used to monitor pH, conductivity, temperature, and dissolved oxygen (DO) were replaced by a multiparameter monitoring device used for in situ measurement and recording. The draft LTRMP Procedures Manual (Soballe et al. 1999) provides additional details.

Ice cover can vary widely in extent and thickness across the study area, complicating sample collection and the recording of sample information. It is not meaningful, for example, to report limnological conditions at 0.2 m below the water surface when the ice extends below this depth, nor to report maximum water depth when ice extends into the substrate. Consequently, when ice is present, LTRMP crews collect near-surface samples at 0.2 m below the bottom of the ice (where possible). The reported sampling depth in this situation (0.2 m) must be adjusted for the vertical extent of ice below the water surface (also recorded) to determine the actual vertical location of the sample in reference to the free water surface. In this report, we summarize the data by depth sampling category rather than precise vertical location, and the sampling depths have not been adjusted for the vertical extent of ice below the water surface. In addition, sites that were frozen to the substrate have been excluded from the summaries of water depth.

Laboratory Analyses

The LTRMP added a limited suite of laboratory analyses to the limnological monitoring in 1991 and expanded the list of chemical constituents in 1993 (Appendix C). From 1991 to 1993, samples for chemical analysis were collected biweekly during the ice-free period; this frequency was reduced to monthly in winter. Also during this period, chemical analyses were performed at the Waterways Experiment Station (WES) laboratories at Vicksburg, Mississippi, and the U.S. Army Corps of Engineers Eau Galle laboratory near Spring Valley, Wisconsin. In 1993, analysis of LTRMP limnological samples was gradually shifted to the UMESC (Table C-2).

In late summer and fall 1996, the UMESC analytical laboratory experienced contamination in its total phosphorus analyses. The problem was eventually identified and eliminated in December 1996; those analytical results affected by this contamination have been excluded from this report and are identified in the LTRMP database. The laboratory also experienced ammonia contamination in May 1996 which invalidated many of the ammonium samples collected in the spring 1996 SRS episode. Those data have also been excluded from this report. Detailed descriptions of the methods used by the UMESC and WES laboratories are available on request from the UMESC in La Crosse, Wisconsin.

Quality Assurance and Quality Control Procedures

The value of LTRMP data depends on their quality and reliability. The use of standard methods to assure and control the quality of the data are thus extremely important. The original LTRMP procedures (Lubinski and Rasmussen 1988) gave guidance on instrument calibration, record keeping, data management, and organizational relations. Revisions to the procedures (Soballe et al. 1999) provided details on assessing the accuracy and precision of field measurements and laboratory determinations and also addressed issues (i.e., daily and seasonal sampling windows, randomization of sampling sites and times) related to the conduct of field work. Strict guidelines for the time of sampling and randomization of sampling were implemented in 1993, and compliance with these guidelines is now monitored (Appendix D).

The LTRMP field teams began collecting additional Quality Assurance and Quality Control (QA/QC) measurements and samples near the end of April 1995 to assess the accuracy and precision of both laboratory and field measurements. The results of QA/QC sampling are not summarized here, but the data are available from the LTRMP database and so we provide the methods in the present report.

About 5% of each type of chemical or physical measurement collected by an LTRMP water quality team is accompanied by a series of QA/QC measurements, and each separate sampling crew performs at least one QA/QC series during each day of field work. Because of logistic constraints, the LTRMP has not yet implemented the use of field spikes (additions of known concentrations of chemical constituents), but does collect four types of QA/QC samples as follows:

Routine: The regular or routine sample or measurement taken at the site.

Field split: A field sample that is as similar as possible to the routine sample at the point of collection. It is used to evaluate laboratory precision and variability introduced by field handling or processing. Field splits are performed for all the constituents listed in Table C-2 that are currently analyzed.

Blank: A sample used to check for contamination of the analytical water supply or sample containers, or contamination and losses during handling and storage. It is also used to evaluate precision near the detection limits of the laboratory.

Replicate: A second, separate sample taken at the same location and in the same way as the routine, but separated by an interval of 5–10 minutes. This provides information on natural, random background variability in ambient conditions.

Results

River Discharge Regime

River discharge (flow) is a major factor in the ecological and limnological structure and functioning of the UMRS. Flow strongly influences limnological conditions, and thus the interpretation of the monitoring data must consider the hydrologic setting (flow regime) under which the data were collected. Because river discharge is so important, staff of the LTRMP assemble the Mississippi and Illinois River discharges and surface elevation data collected by the U.S. Geological Survey and the U.S. Army Corps of Engineers into a database at the UMESC (Wlosinski et al. 1995). The discharge and water elevation data used in this report were obtained from this database.

Water levels at the Lock and Dam 3 tailwater gage (Figure 3) indicate the general hydrologic regime in the Pool 4—Lake Pepin study area. Flood stage at this gage is 207.3 m (680.2 feet) above mean sea level. The U.S. Army Corps of Engineers water elevation data were obtained from the UMESC (Wlosinski et al. 1995).

Water levels at this site reflect the large flood of 1993 and indicate that water levels during the entire reporting period have generally been above the 56-year average but below flood stage except in summer 1993. The flood of 1993 was notable for high water levels but more remarkable for its duration (nearly the entire summer) and late occurrence. Maximum discharge in the Upper Mississippi River usually occurs each year in late April, but this flood peaked in June (Figure 3). From 1993 to 1996, both spring and fall water levels have been substantially above average, which has probably influenced the limnological data.

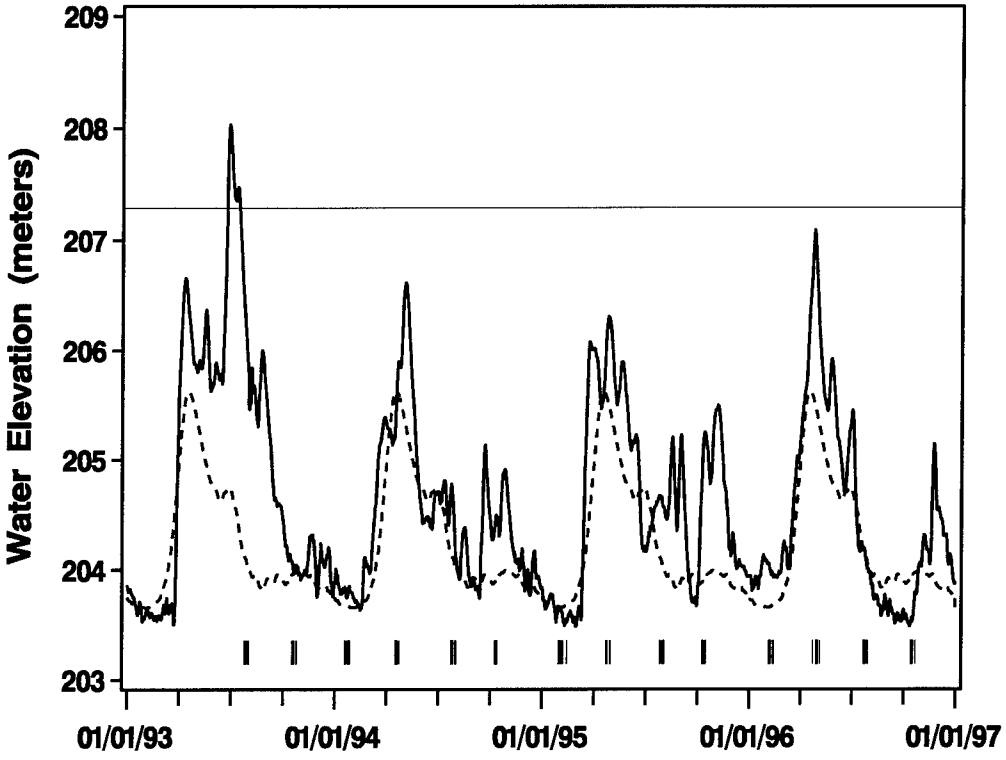

Figure 3. Water elevation (meters above mean sea level) at Lock and Dam 3 Tailwater from 1993–1996 (*solid line*) compared with the average elevation for each day of the year from 1940 to 1996 (*dashed line*). Vertical lines above the horizontal axis indicate dates of stratified random sampling. Water elevation for flood stage is indicated by the horizontal line.

Fixed-site Sampling

Sample Collection and Field Measurements

The volume of field work completed by each field station is important to document for planning and budgetary purposes. The schedule of sample collection is also important to document because many of the limnological characteristics monitored by the LTRMP exhibit regular daily (diel) patterns. The time of

measurement can thus strongly influence the value that is observed and, because the LTRMP strives to monitor patterns over time across the UMRS, it is important that sampling times be consistent and unbiased over time, among sampling locations, and among field stations.

From 1993 to 1996, the Lake City water quality team made about 2,700 site visits to fixed sampling locations (Appendix D). During these visits, about 2,600 grab samples were collected for chemical processing (Appendix E).

The number of fixed-sites visits was slightly reduced (from 27 to 24) when the sampling network was revised in early 1993 (Figure D-4). Four fixed sites in Lake Pepin are sampled weekly from May through September, but water samples are collected biweekly for chemical analysis in the normal LTRMP fixed-site routine. During the off-weeks, these four sites are sampled for in situ measurements only for the LTRMP, but water samples are collected for other agencies involved with the phosphorus studies of Lake Pepin (Figure D-4; Table D-2).

The distribution of sampling across the hours of the day (Figures D-1–D-3) reflects a September 1993 change in the fixed-site sampling protocol. In the early months of 1993, sampling was conducted earlier in the day (median = 1100 h) and showed a somewhat broad distribution. The sampling window was more closely (and formally) defined in 1993, and subsequently the median sampling time moved closer to noon (Figure D-1). However, the sampling window is still quite broad, and although it does center on noon, the median sampling time has increased each year and shows a significant ($P < 0.001$) trend (about 18 minutes per year). The biggest part of this increase reflects the change to a noon-centered sampling window in 1993. The median quarterly sampling time was relatively constant after mid-1994, but continued to slightly, but significantly ($P < 0.001$), increase at about 7 minutes per year. The distribution of fixed-site sampling times across the period of record (Figure D-2) shows no obvious seasonal pattern.

The distribution of median sampling times for sites (Figure D-3) is parallel to that for samples (Figure D-1). In 1993, the median sampling time varied substantially among sites (Figure D-3) and most sites were sampled in the morning. After noon-centered sampling was implemented in 1993, the median sampling times in 1994 and 1995 were close together and centered on noon (Figure D-3). In 1996, the median site times became bimodal, due in large part to the change in the number of days fixed sites are sampled during open water (from 3 days to 2). This 2-day routine causes a few sites to be sampled over a relatively long period, while most sites are sampled in a short period. Certain fixed sites (e.g., those in Lake Pepin) require more time at the site for sampling and travel time between sites is greater. Also, some sites are sampled from a bridge or Lock and Dam and the time required to reach the next site sampled by boat can be considerable, whereas other sites are in close proximity (e.g. main channel and tributaries) and six to eight sites can be sampled in a relatively short period. The logistics and randomization of this fixed-site sampling scheme will be modified if the time distribution is deemed inappropriate.

Fixed-site Sampling Data

Fixed-site sampling by the Lake City Field Station from 1993 to 1996 has generated a large volume of data (Appendix E). These data allow comparisons of tributary and mainstem inflows and outflows within this study area and thus provide information on sources of material such as nutrients and suspended sediment and the functioning of the study reach as a processor of those materials.

The fixed-site data reveal important functional aspects of this reach of the river. For example, the role of Lake Pepin as a trap for suspended sediment and total phosphorus is clearly shown by the fixed-site data

from the upstream and downstream end of Pool 4 (Figure E-2a). Another important aspect of Lake Pepin during the summer months is that it is a net source of soluble reactive phosphorus rather than a sink (Figure E-2a). James and Barko (1996) found high rates of release of soluble reactive phosphorus from Lake Pepin sediments under both oxic and anoxic conditions; this is certainly a major factor in the export of soluble reactive phosphorus from Lake Pepin. The LTRMP data also suggest a decline in concentrations of both total nitrogen and nitrate–nitrite nitrogen. When coupled with the flow regime, this suggests a decline in the loading of these nutrients in this reach; however, this apparent trend has not been verified.

The data also show a decrease in soluble reactive phosphorus concentration in 1994 (Figures E-2a–E-2d). However, this apparent trend has not been detected in monitoring by the Minnesota Pollution Control Agency or Metropolitan Council in this reach. We thus believe that this apparent decline is an artifact resulting from a change in analytical laboratories in 1994—from the WES laboratories in Vicksburg to the UMESC laboratory—and a change in sample preservation methods (freezing substituted for acidification).

The strong seasonality of flow-related parameters (e.g., turbidity, Secchi disk transparency, suspended solids, total phosphorus) in Pool 4 and its tributaries is clearly shown by the fixed-site data (Appendix E). During the open-water season the inflow of total suspended solids into Pool 4 is typically predominated by inorganic sediment. As the sediment settles out in Lake Pepin, the ratio of inorganic to organic solids becomes much lower downstream.

The low concentrations of suspended solids and nutrients in the Chippewa River in relation to other tributaries in this area is also documented in these data (Figure E-2). The highest concentrations of suspended solids were observed in the Zumbro River in August 1993, and again in June 1994 and June 1996, indicating the susceptibility to runoff and erosion during heavy rainfall in this watershed. Although the Zumbro River may be the most notable, all the tributaries monitored—including the Chippewa River—have been documented carrying high concentrations of suspended solids and nutrients during heavy rainfall.

Dissolved oxygen saturation is a function of water temperature and thus shows strong seasonality at all sites. Monthly means do not reveal extremes in DO, and the LTRMP sampling schedule (centered on noon) does not give a good representation of extremely low (expected near sunrise) or high (expected in mid- or late afternoon) oxygen concentrations. Most DO values were measured at near or above saturation with the exception of some samples collected near the bottom of Lake Pepin (Table E-1; Figure E-1). Lake Pepin temporally stratifies during calm periods of low to moderate flow in summer. During vertical stratification, DO concentrations near the bottom in the deeper waters of the lake will quickly drop below 5 mg/L.

Stratified Random Sampling

Sample Collection and Field Measurements

As in fixed-site sampling, the number and frequency of samples collected and the scheduling of sample collection in SRS is important for planning and data interpretation. Sample collection in SRS must be consistent and unbiased over time, within each sampling episode, across sampling strata, and among LTRMP field stations. The partitioning of effort among strata within each SRS episode (Table B-1) reflects an emphasis on off-channel areas and a recognition that these areas are likely to be more spatially variable than the main channel.

From 1993 through 1996, the field station participated in 14 stratified, random sampling episodes. In these 14 episodes, the field team visited about 1,900 sites (Appendix B), and about 1,800 grab samples were

collected for chemical analyses. Most of these were analyzed for chlorophyll *a* and suspended solids, but in accord with the design for SRS, about half the samples (1,000) were also analyzed for nitrogen and phosphorus species.

The total number of sites sampled in each episode and stratum is relatively uniform across the period of record (Table B-2). There is some variability in the number of samples collected, due mainly to the availability of water in the backwaters, particularly in winter when ice depth is a factor.

Stratified random sampling by the Lake City field team has conformed well to the general LTRMP design. The distribution of SRS times across the period of record (Figure D-5) shows no obvious seasonal pattern, and, for most strata, there is no significant linear trend in sampling times over the years ($P > 0.05$). The sampling times are generally well centered on noon, but there is some indication that side channels tend to be sampled slightly later than other strata, and sampling times in the main channel exhibit a minor, but statistically significant ($P < 0.05$) increase over time (averaging about 3 minutes per episode). The trend in main channel times is due mainly to adjustments during the first year of SRS.

Stratified Random Sampling Data

The SRS provides an unbiased estimate of conditions within each sampling stratum during each of four quarterly episodes per year. Seasonality, interannual variations, and long-term trends within each strata can be assessed with summaries of these data (Appendix F), but some of the most valuable applications for these data require analyses that are beyond the scope of this report. For example, the SRS provides statistically valid estimates of the extent or frequency of limnological conditions in combination (e.g., to meet the temperature, DO, and velocity requirements of overwintering fish) and this information is being used to address changing relations among limnological variables over time, differences among the sampling strata, and habitat availability and suitability in the Upper Mississippi River ecosystem (Fischer et al. 1997; Soballe et al. 1997).

The SRS results (Appendix F), as with the fixed-site data, indicate a general decline in nitrogen concentrations from 1993 to 1996 (Figure F-8). The strong seasonality in most monitored parameters is evident, with minimal total suspended solids, volatile suspended solids, and turbidity during winter episodes and consistent and higher concentrations during the other seasons. Secchi transparency and ammonium exhibit winter maxima.

Seasonality in chlorophyll *a* is less pronounced, although low concentrations are typical in winter. This is not always the case, however, and substantial chlorophyll *a* concentrations have been observed beneath the ice. The seasonality of DO, driven by solubility, is obvious.

The peaks of ammonium nitrogen during the winter episodes of 1994 and 1996 (Figure F-3a) are probably due to the relatively low densities of phytoplankton during these winters, as indicated by low chlorophyll *a* levels. Low phytoplankton densities would result in less uptake of ammonium nitrogen and thus higher concentrations. Burdis and Popp (1996) found that discharge and the percentage of snow cover were the two most important variables controlling phytoplankton densities in Lake Pepin in winter. Chlorophyll *a* concentrations in winter 1995 were considerably higher, and ammonium levels, discharge, and snow cover and snow depth were considerably lower, than in the winters of 1994 and 1996.

Summary and Recommendations

This report documents 4 years of monitoring (1993–96) by personnel at the Lake City Field Station and provides basic graphic and tabular summaries of the collected data. The Lake City field team made about 2,700 visits to fixed sampling sites and 1,900 visits to stratified random sites from 1993 through 1996. This period was marked by several important events, including the redesign of the monitoring network and the updating of field equipment in 1993, record flooding in spring and summer 1993, and above-average discharge levels.

The monitoring data show that Lake Pepin and the Mississippi River near Lake City, Minnesota, are moderately turbid (average turbidity <20 NTU), have near-saturated DO concentrations at most locations throughout most of the year (near midday), and have high concentrations of nitrogen (TN average about 2.5 mg/L) and phosphorus (TP average about 0.13 mg/L). Downward trends were observed in the concentrations of total and nitrate–nitrite nitrogen. Lake Pepin has a significant effect on water quality by acting as a settling basin for suspended solids and nutrients, although it is a net source of soluble reactive phosphorus in summer. The tributaries of Pools 4 and 5 have been found to carry high concentrations of suspended solids and nutrients during heavy rainfall. The Chippewa River typically has lower concentrations of suspended solids and nutrients than other tributaries.

Because a number of water quality parameters vary greatly with season and discharge, determining true long-term water quality trends can be challenging. A number of other complicating factors (e.g., frequency of sampling, farming practices, flood–drought cycles) make predictions about the effects of discharge or seasonality on certain water quality parameters uncertain. The determination of whether multiyear declines in certain plant nutrients or suspended solids are the transitory result of several years of low discharge or actual long-term trends that are the consequence of real changes in land-use practices cannot be made with data sets of fewer than 10 to 15 years (i.e., data from more than one flood–drought cycle). B. Wilson (Minnesota Pollution Control Agency; personal communication) and M. Meyer (Minnesota Metropolitan Council Environmental Services; personal communication) have analyzed long-term (>10 years) stream–watershed data and have observed an increase in the concentration of suspended solids and plant nutrients in the wet years immediately following an extended drought period, followed by a gradual decrease in concentration of these parameters in subsequent years through the next drought period. The data set collected by the Lake City Field Station indicates a decreasing trend in nitrogen concentration. Determining whether this represents a continuing, long-term decline in nitrogen, a response to the drought of 1987–89, or a response to the flood of 1993 is difficult. The importance of a long-term data set becomes clear in that long-term trends may only be ascertained by comparing key parameter concentrations at equivalent points on the long-term hydrograph (i.e., such as the years immediately following the last two periods of drought).

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Appendix A. Fixed-site Sampling Sites: January 1993–December 1996

In Appendix A, we provide information on the sample collection sites used from January 1993 through December 1996. In some instances, sites not used during this period have been included for reference. The site description tables provide additional information on the locations and are keyed to the site map. The sites lists are provided in three formats to allow easy cross referencing: (1) by map identifier (north–south, then east–west), (2) in alphabetical order, and (3) by habitat class. The period of record for each site is also portrayed graphically (Figure A-5) so that the duration of and interruptions in the record can be easily visualized.

Location codes (seven characters) used for routine fixed-site sampling are based on the distance upstream from the river mouth or major confluence (river miles and tenths) and on the relative left-to-right (facing upstream) location of the site between the horizontal limits of the geological–historical floodplain. Sites on the Mississippi and Illinois River main stems use a single-letter prefix (M or I, respectively), whereas tributaries and Missouri River sites use a two-letter prefix (Table A-5). The left-to-right location of a site is indicated by a suffix between A and Z. When tributary sites are sampled in midstream, they are assigned the suffix M without regard to position in the floodplain. Locations near the left or right bank (facing upstream) are indicated with an A or Z, respectively.

Habitat classes (Table A-4) are assigned to all Long Term Resource Monitoring Program sampling locations used in fixed-site monitoring. Although these classes convey significant information about the site, the fixed sites are subjectively chosen and cannot be assumed to represent the associated habitat classes (see stratified random sampling, Appendix B).

Table A-1. Long Term Resource Monitoring Program fixed-site water quality sampling locations keyed to map codes with associated period of record from 1993 to 1996, habitat class, Universal Transverse Mercator (UTM) Coordinates (zone 15, meters), and the number of sampling visits to the site.

Location code	Map identification	Period of record	Habitat class[a]	UTM		Site visits 1993–1996
				Easting	Northing	
M796.9N	1	11/05/90–12/31/96	MC	531001	4939807	106
M796.9M	2	04/28/93–12/31/96	MC	531047	4939664	91
M796.7M	3	01/24/90–04/12/93	MC	531626	4939642	15
VM00.1M	4	01/24/90–12/31/96	TRIB	532303	4938817	106
CN00.1M	5	01/24/90–12/31/96	TRIB	532272	4938767	106
M793.9P	6	01/24/90–04/12/93	MC	534406	4938355	15
M792.5N	7	11/05/90–04/12/93	SC	536344	4936971	15
M786.1S	8	01/25/90–04/13/93	IMP–L	543794	4935869	15
M790.3F	9	01/24/90–04/12/93	BWC	537282	4935661	15
M787.9H	10	04/02/91–04/12/93	BWC	540890	4935522	15
M781.2X	11	01/25/90–04/13/93	IMP–L	551310	4935516	15
M786.5D	12	04/28/93–12/31/96	SC	542976	4934745	88
M786.2C	13	04/28/93–12/31/96	MC	543779	4934266	90
M781.2O	14	01/26/90–12/31/96	IMP–L	551416	4933885	142
M781.2E	15	01/26/90–04/13/93	IMP–L	551514	4932250	15
M775.6Y	16	01/25/90–04/13/93	IMP–L	557162	4926279	15
M775.6Q	17	01/25/90–12/31/96	IMP–L	556373	4925675	142
M775.6L	18	01/25/90–04/13/93	IMP–L	555572	4924953	15
M771.2P	19	04/29/93–12/30/96	IMP–L	561539	4921651	127
M766.0O	20	01/26/90–04/13/93	IMP–L	569220	4920225	15
M766.0I	21	01/26/90–12/30/96	IMP–L	568951	4919038	141
M766.0B	22	01/26/90–04/13/93	IMP–L	568732	4917935	15
M764.3A	23	04/29/93–12/30/96	MC	571635	4917826	90
CH00.1M	24	01/29/90–12/30/96	TRIB	572933	4917624	105
M761.5E	25	01/29/90–04/16/93	MC	575460	4916388	15
M758.6X	26	02/07/90–04/16/93	BWC	581454	4915943	15
M758.6Y	27	02/07/90–04/16/93	BWC	581212	4915699	15
M760.7O	28	01/29/90–04/16/93	MC	576401	4915321	15
M757.2Z	29	04/29/93–12/30/96	BWC	582462	4914360	91
M757.4O	30	04/03/91–04/16/93	BWC	580808	4912312	15
M757.5O	31	04/03/91–04/16/93	BWC	580650	4912238	15
M753.2V	32	01/30/90–04/16/93	IMP	584545	4908931	15
M753.2S	33	01/30/90–04/16/93	IMP	583985	4908555	15
M753.1X	34	04/29/93–12/30/96	BWC	585096	4908533	91
M752.8Z	35	04/30/93–12/19/96	MC	586174	4908276	89
M752.8Y	36	04/30/93–12/19/96	MC	585823	4908119	90
ZM00.1M	37	04/30/93–12/19/96	TRIB	585582	4904640	86
M747.3R	38	04/30/93–12/19/96	SC	587763	4901328	89
M746.9Y	39	04/30/93–12/19/96	SC	589372	4901280	90
M745.2L	40	04/30/93–12/19/96	SC	589565	4898404	88
WW01.3M	41	04/30/93–12/19/96	TRIB	586129	4895406	90
M742.8D	42	04/30/93–12/19/96	SC	589565	4894957	89
M742.6B	43	04/30/93–12/19/96	SC	589536	4894604	89
M738.2F	44	05/13/93–12/19/96	MC	595044	4890151	89

[a] See Table A-4 for habitat class descriptions.

Table A-2. Long Term Resource Monitoring Program fixed-site water quality sampling sites sorted by location code with associated period of record from 1993 to 1996, habitat class, Universal Transverse Mercator (UTM) Coordinates (zone 15, meters), and number of sampling visits to the site.

Location code	Map identification	Period of record	Habitat class[a]	UTM		Site visits 1993–1996
				Easting	Northing	
CH00.1M	24	01/29/90–12/30/96	TRIB	572933	4917624	105
CN00.1M	5	01/24/90–12/31/96	TRIB	532272	4938767	106
M738.2F	44	05/13/93–12/19/96	MC	595044	4890151	89
M742.6B	43	04/30/93–12/19/96	SC	589536	4894604	89
M742.8D	42	04/30/93–12/19/96	SC	589565	4894957	89
M745.2L	40	04/30/93–12/19/96	SC	589565	4898404	88
M746.9Y	39	04/30/93–12/19/96	SC	589372	4901280	90
M747.3R	38	04/30/93–12/19/96	SC	587763	4901328	89
M752.8Y	36	04/30/93–12/19/96	MC	585823	4908119	90
M752.8Z	35	04/30/93–12/19/96	MC	586174	4908276	89
M753.1X	34	04/29/93–12/30/96	BWC	585096	4908533	91
M753.2S	33	01/30/90–04/16/93	IMP	583985	4908555	15
M753.2V	32	01/30/90–04/16/93	IMP	584545	4908931	15
M757.2Z	29	04/29/93–12/30/96	BWC	582462	4914360	91
M757.4O	30	04/03/91–04/16/93	BWC	580808	4912312	15
M757.5O	31	04/03/91–04/16/93	BWC	580650	4912238	15
M758.6X	26	02/07/90–04/16/93	BWC	581454	4915943	15
M758.6Y	27	02/07/90–04/16/93	BWC	581212	4915699	15
M760.7O	28	01/29/90–04/16/93	MC	576401	4915321	15
M761.5E	25	01/29/90–04/16/93	MC	575460	4916388	15
M764.3A	23	04/29/93–12/30/96	MC	571635	4917826	90
M766.0B	22	01/26/90–04/13/93	IMP–L	568732	4917935	15
M766.0I	21	01/26/90–12/30/96	IMP–L	568951	4919038	141
M766.0O	20	01/26/90–04/13/93	IMP–L	569220	4920225	15
M771.2P	19	04/29/93–12/30/96	IMP–L	561539	4921651	127
M775.6L	18	01/25/90–04/13/93	IMP–L	555572	4924953	15
M775.6Q	17	01/25/90–12/31/96	IMP–L	556373	4925675	142
M775.6Y	16	01/25/90–04/13/93	IMP–L	557162	4926279	15
M781.2E	15	01/26/90–04/13/93	IMP–L	551514	4932250	15
M781.2O	14	01/26/90–12/31/96	IMP–L	551416	4933885	142
M781.2X	11	01/25/90–04/13/93	IMP–L	551310	4935516	15
M786.1S	8	01/25/90–04/13/93	IMP–L	543794	4935869	15
M786.2C	13	04/28/93–12/31/96	MC	543779	4934266	90
M786.5D	12	04/28/93–12/31/96	SC	542976	4934745	88
M787.9H	10	04/02/91–04/12/93	BWC	540890	4935522	15
M790.3F	9	01/24/90–04/12/93	BWC	537282	4935661	15
M792.5N	7	11/05/90–04/12/93	SC	536344	4936971	15
M793.9P	6	01/24/90–04/12/93	MC	534406	4938355	15
M796.7M	3	01/24/90–04/12/93	MC	531626	4939642	15
M796.9M	2	04/28/93–12/31/96	MC	531047	4939664	91
M796.9N	1	11/05/90–12/31/96	MC	531001	4939807	106
VM00.1M	4	01/24/90–12/31/96	TRIB	532303	4938817	106
WW01.3M	41	04/30/93–12/19/96	TRIB	586129	4895406	90
ZM00.1M	37	04/30/93–12/19/96	TRIB	585582	4904640	86

[a] See Table A-4 for habitat class descriptions.

Table A-3. Long Term Resource Monitoring Program fixed-site water quality sampling locations sorted by habitat class with associated period of record from 1993 to 1996, habitat class, Universal Transverse Mercator (UTM) Coordinates (zone 15, meters), and number of sampling visits to the site.

Location code	Map identification	Period of record	Habitat class[a]	UTM		Site visits 1993–1996
				Easting	Northing	
M753.1X	34	04/29/93–12/30/96	BWC	585096	4908533	91
M757.2Z	29	04/29/93–12/30/96	BWC	582462	4914360	91
M757.4O	30	04/03/91–04/16/93	BWC	580808	4912312	15
M757.5O	31	04/03/91–04/16/93	BWC	580650	4912238	15
M758.6X	26	02/07/90–04/16/93	BWC	581454	4915943	15
M758.6Y	27	02/07/90–04/16/93	BWC	581212	4915699	15
M787.9H	10	04/02/91–04/12/93	BWC	540890	4935522	15
M790.3F	9	01/24/90–04/12/93	BWC	537282	4935661	15
M753.2S	33	01/30/90–04/16/93	IMP	583985	4908555	15
M753.2V	32	01/30/90–04/16/93	IMP	584545	4908931	15
M766.0B	22	01/26/90–04/13/93	IMP–L	568732	4917935	15
M766.0I	21	01/26/90–12/30/96	IMP–L	568951	4919038	141
M766.0O	20	01/26/90–04/13/93	IMP–L	569220	4920225	15
M771.2P	19	04/29/93–12/30/96	IMP–L	561539	4921651	127
M775.6L	18	01/25/90–04/13/93	IMP–L	555572	4924953	15
M775.6Q	17	01/25/90–12/31/96	IMP–L	556373	4925675	142
M775.6Y	16	01/25/90–04/13/93	IMP–L	557162	4926279	15
M781.2E	15	01/26/90–04/13/93	IMP–L	551514	4932250	15
M781.2O	14	01/26/90–12/31/96	IMP–L	551416	4933885	142
M781.2X	11	01/25/90–04/13/93	IMP–L	551310	4935516	15
M786.1S	8	01/25/90–04/13/93	IMP–L	543794	4935869	15
M738.2F	44	05/13/93–12/19/96	MC	595044	4890151	89
M752.8Y	36	04/30/93–12/19/96	MC	585823	4908119	90
M752.8Z	35	04/30/93–12/19/96	MC	586174	4908276	89
M760.7O	28	01/29/90–04/16/93	MC	576401	4915321	15
M761.5E	25	01/29/90–04/16/93	MC	575460	4916388	15
M764.3A	23	04/29/93–12/30/96	MC	571635	4917826	90
M786.2C	13	04/28/93–12/31/96	MC	543779	4934266	90
M793.9P	6	01/24/90–04/12/93	MC	534406	4938355	15
M796.7M	3	01/24/90–04/12/93	MC	531626	4939642	15
M796.9M	2	04/28/93–12/31/96	MC	531047	4939664	91
M796.9N	1	11/05/90–12/31/96	MC	531001	4939807	106
M742.6B	43	04/30/93–12/19/96	SC	589536	4894604	89
M742.8D	42	04/30/93–12/19/96	SC	589565	4894957	89
M745.2L	40	04/30/93–12/19/96	SC	589565	4898404	88
M746.9Y	39	04/30/93–12/19/96	SC	589372	4901280	90
M747.3R	38	04/30/93–12/19/96	SC	587763	4901328	89
M786.5D	12	04/28/93–12/31/96	SC	542976	4934745	88
M792.5N	7	11/05/90–04/12/93	SC	536344	4936971	15
CH00.1M	24	01/29/90–12/30/96	TRIB	572933	4917624	105
CN00.1M	5	01/24/90–12/31/96	TRIB	532272	4938767	106
VM00.1M	4	01/24/90–12/31/96	TRIB	532303	4938817	106
WW01.3M	41	04/30/93–12/19/96	TRIB	586129	4895406	90
ZM00.1M	37	04/30/93–12/19/96	TRIB	585582	4904640	86

[a] See Table A-4 for habitat class descriptions.

Table A-4. Habitat classes used in fixed-site water quality sampling. Previous habitat classes refer to categories used from 1988 to 1993 and are now combined within each of the current habitat classes.

Current habitat class designator	Previous habitat designators included in current class	Habitat class description
BWC	BWC, BWC-O, BWC-V	Contiguous backwaters
BWI	BWI, BWI-O, BWI-V	Isolated backwaters
SC	SC, SCB, SCT, SCU	Side channels
IMP	IMP-O, IMP-V	Impounded areas
IMP-L	IMP-L	Lakes—Swan or Pepin
MC	MC, CTR, CBU, CBW, TW, TWB, TWBU, TWR-O, TWW	Main channel
TRIB	TRIB, TRM	Tributary

Table A-5. Abbreviations used to designate fixed-site sampling locations in the Long Term Resource Monitoring Program (LTRMP). Not all streams in this list have been sampled by the LTRMP. The Mackinaw, Spoon, and Sangamon Rivers are all tributaries to the Illinois River. Each site identifier includes the distance (in miles) above the tributary mouth (xx.x) and the relative location (A–Z) of the sampling site between the left and right (facing upstream) limits of the floodplain.

Site identifier	Tributary name
APxx.xM	Apple River, Mo.[a]
ALxx.xM	Apple River, Ill.
BCxx.xM	Bob's Creek, Mo.
BFxx.xM	Buffalo River, Wis.
BKxx.xM	Black River, Wis.
BMxx.xM	Big Muddy River, Ill.
BXxx.xM	Bad Axe River, Wis.
CAxx.xM	Cahokia Creek, Ill.
CCxx.xM	Coon Creek, Wis.
CFxx.xM	Catfish Creek, Iowa
CHxx.xM	Chippewa River, Wis.
CNxx.xM	Cannon River, Minn.
CRxx.xM	Cache River, Ill.
CUxx.xM	Cuivre River, Mo.
DCxx.xM	Dardenne Creek, Mo.
DMxx.xM	Des Moines River, Iowa
ERxx.xM	Elk River, Iowa
HDxx.xM	Headwaters Diversion, Mo. (Formerly Little River, LRxx.xM)
Ixxx.xZ	Illinois River, Ill.
IWxx.xM	Iowa River, Iowa
LMxx.xM	LaMoines River, Ill.
LRxx.xM	Little River, Mo. (Now Headwaters Diversion, HDxx.xM)
LXxx.xM	La Crosse River, Wis.
Mxxx.xZ	Mississippi River (main stem)
MCxx.xM	Mill Creek, Iowa
MKxx.xM	Mackinaw River, Ill.
MOxx.xM	Missouri River, Mo.
MQxx.xM	Maquoketa River, Iowa
PExx.xM	Peruque Creek, Mo.
PIxx.xM	Piasa Creek, Ill.
PRxx.xM	Plum River, Ill.
QVxx.xM	Quiver Creek, Ill.
Rxxx.xM	Root River, Minn.

Table A-5. Continued.

Site identifier	Tributary name
RCxx.xM	Rush Creek, Ill.
Sxxx.xM	Spoon River, Ill.
SGxx.xM	Sangamon River, Ill.
SKxx.xM	Skunk River, Iowa
SXxx.xM	St. Croix River, Minn./Wis.
UIxx.xM	Upper Iowa River, Iowa
VMxx.xM	Vermillion River, Minn
WDxx.xM	Wood River, Ill.
WPxx.xM	Wapsipinicon River, Iowa
WSxx.xM	Wisconsin River, Wis.
WWxx.xM	Whitewater River, Minn.
YLxx.xM	Yellow River, Iowa
ZMxx.xM	Zumbro River, Minn.

[a] State abbreviations, Minn. = Minnesota, Wis. = Wisconsin, Ill. = Illinois, Mo. = Missouri

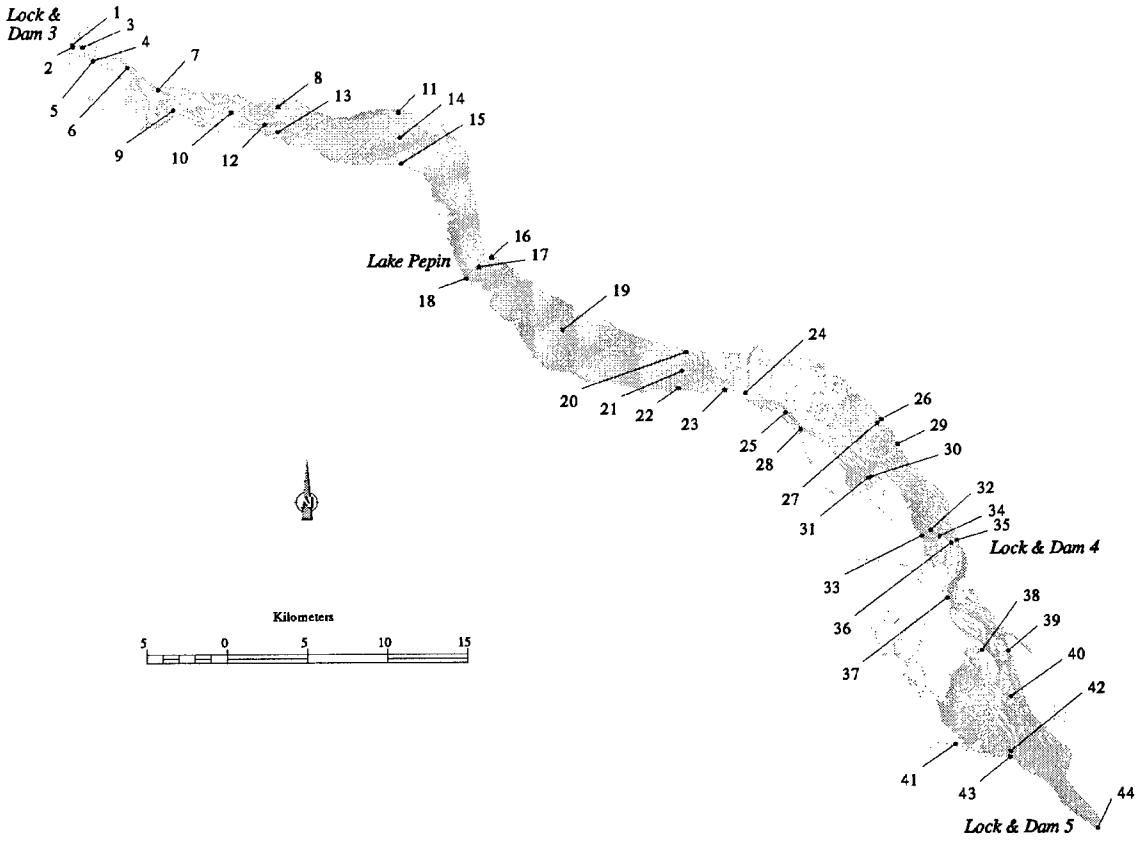

Figure A-1. Fixed-site sampling locations in the Lake City study area.

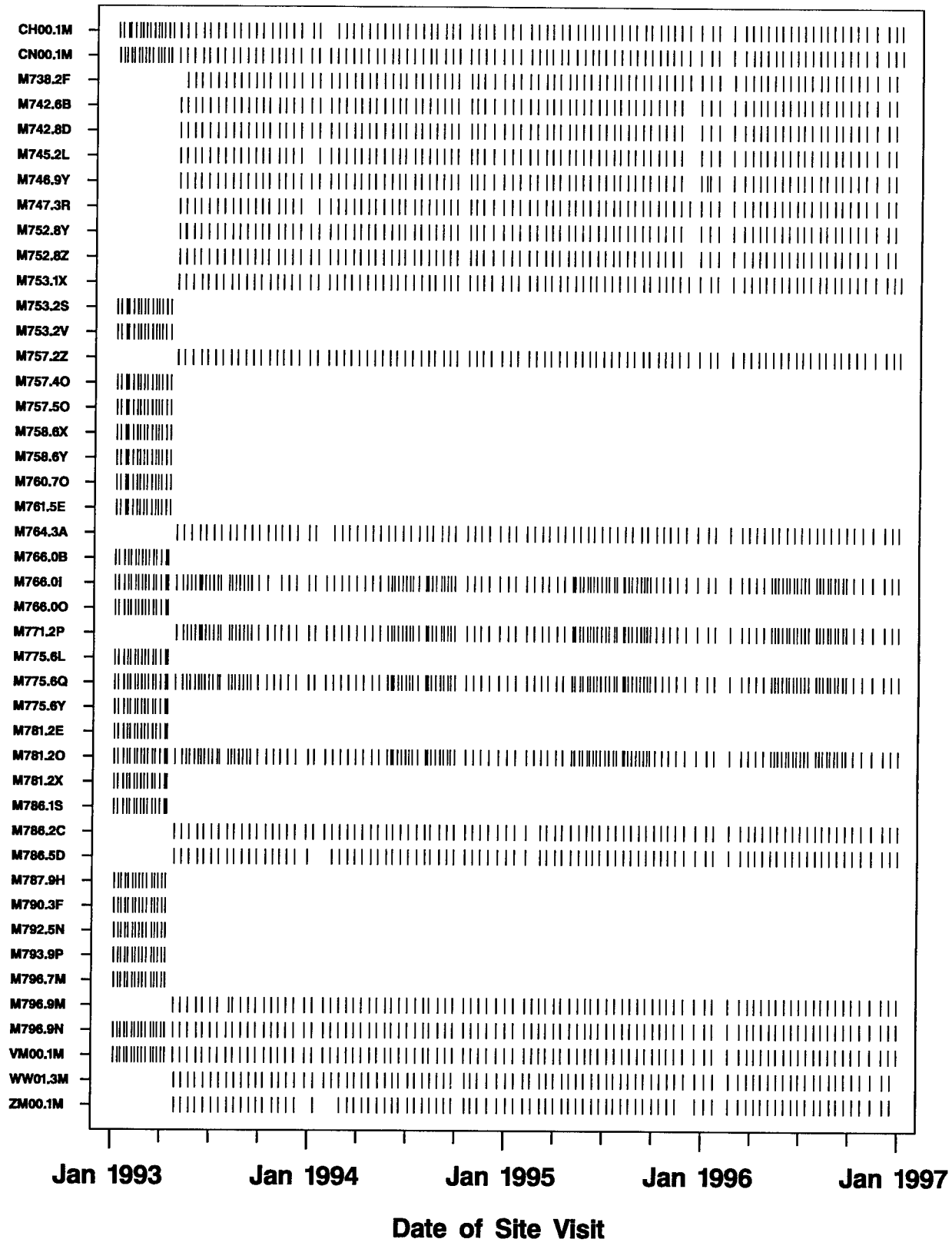

Figure A-2. Sampling dates from January 1993 through December 1996 at each of the fixed sites monitored by the Lake City Field Station.

Appendix B. Stratified Random Sampling Sites: January 1993–December 1996

Randomly selected sites are used in stratified random sampling (SRS) to provide an unbiased representation of sampling strata (and entire study areas) within each Long Term Resource Monitoring Program study reach. Individual sites are generally not resampled in subsequent SRS episodes. Information from an individual site is not intended to be interpreted in isolation, as it is only a single random measurement from all the locations within a stratum during a specific episode. When pooled together, multiple measurements (sites) from each stratum provide a statistically reliable sample of the episode and the study reach.

Unlike the fixed-site location maps (Appendix A), the maps provided for SRS do not show the individual sampling locations, but rather the sampling strata within the reach. This approach allows a legible portrayal and de-emphasizes the individual identities of SRS locations.

The tables in Appendix B show the allocation of sampling effort across the sampling strata and across the 14 SRS episodes within the 1993–96 period.

Table B-1. Sampling strata and design allocation of sampling effort for water quality stratified random sampling in the vicinity of the Lake City Field Station. Total area of the study reach is greater than the total area included within the sampling strata due to inaccessible areas that are excluded from sampling.

Sampling stratum	Area within the stratum (ha)	Fraction of study area within the stratum (%)	Number of potential sampling sites in the stratum[a]	Number of sites assigned	Fraction of stratum sampled (%)	Fraction of total effort (%)
Main channel	1,240	8	310	25	8.1	19
Side channel	722	5	2,887	30	1.0	22
Backwater	2,301	16	9,203	50	0.5	37
Lake	9,764	66	2,441	30	1.2	22
Impounded	0	0	—	—	0.0	0
Isolated	660	4	165	—	0.0	0
Total[b]	14,833	99	15,006	135	0.9	100

[a] Total potential sites reflects a 200-m grid in most strata but a 50-m grid in side channels and backwaters.
[b] Total area refers to the entire pool or study reach and is greater than the sum of areas within the sampling strata.

Table B-2. Sampling dates and sampling activity of the Lake City Field Station in each stratified random sampling episode from 1993 through 1996.

Sampling period			Number of samples collected/sites visited						
Episode	Start date	End date	Total	Main channel	Side channel	Contiguous backwater	Lake	Impoundment	Isolated
Summer 93	07/26/93	08/03/93	216/135	25/25	32/30	99/50	60/30	NA	NA
Fall 93	10/18/93	10/26/93	200/135	25/25	30/30	85/50	60/30	NA	NA
Winter 94	01/19/94	01/28/94	188/124	14/14	30/30	84/50	60/30	NA	NA
Spring 94	04/18/94	04/25/94	213/135	25/25	30/30	98/50	60/30	NA	NA
Summer 94	07/25/94	08/03/94	204/135	25/25	30/30	89/50	60/30	NA	NA
Fall 94	10/10/94	10/14/94	201/135	25/25	30/30	86/50	60/30	NA	NA
Winter 95	01/30/95	02/06/95	180/132	25/25	30/30	65/47	60/30	NA	NA
Spring 95	04/24/95	05/02/95	214/135	25/25	31/30	98/50	60/30	NA	NA
Summer 95	07/27/95	08/04/95	192/134	24/24	30/30	78/50	60/30	NA	NA
Fall 95	10/09/95	10/16/95	208/135	26/25	30/30	92/50	60/30	NA	NA
Winter 96	02/05/96	02/14/96	188/135	25/25	31/30	73/50	59/30	NA	NA
Spring 96	04/29/96	05/06/96	214/135	25/25	32/30	97/50	60/30	NA	NA
Summer 96	07/22/96	07/30/96	205/135	25/25	29/29	91/51	60/30	NA	NA
Fall 96	10/14/96	10/22/96	197/134	25/25	31/30	81/49	60/30	NA	NA

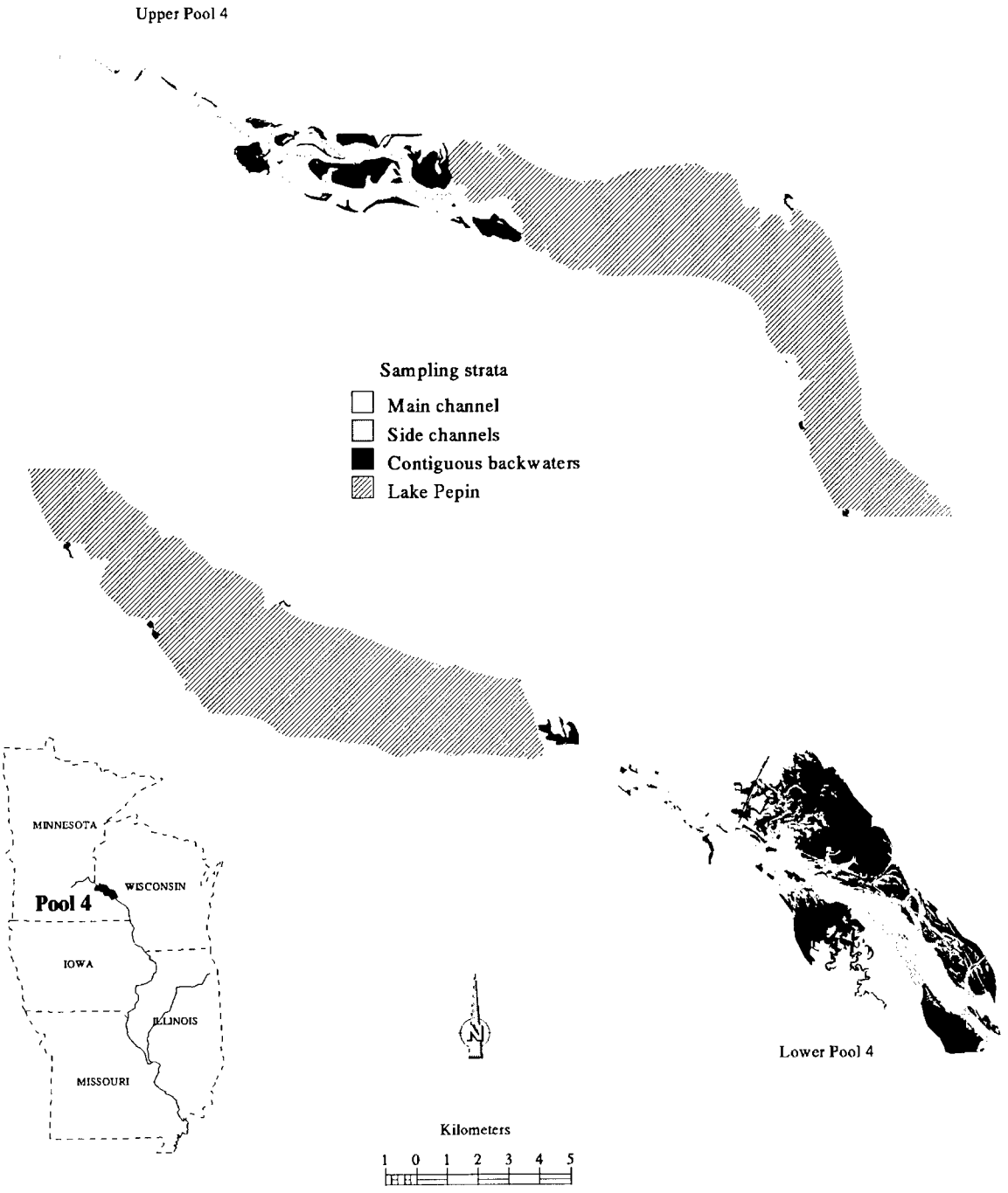

Figure B-1. Long Term Resource Monitoring Program sampling strata used in water quality stratified random sampling in the vicinity of the Lake City Field Station.

Appendix C. Limnological Parameters Measured in the Long Term Resource Monitoring Program

Table C-1. Period of record for limnological measurements (laboratory and in situ) performed by Long Term Resource Monitoring Program field teams from 1988 through 1996.

Parameter	1988	1989	1990	1991	1992	1993–1996
Water temperature						
Dissolved oxygen						
Conductivity						
pH				June		
Turbidity						
Secchi depth						
Total suspended solids						
Volatile suspended solids						
Chlorophyll *a*				June		
Total phosphorus				June		
Soluble reactive phosphorus				June		
Total soluble phosphorus				June		Apr 93
Total nitrogen				June		
Total soluble nitrogen				June		Apr 93
NO_x (nitrate plus nitrite)				June		
NH_x (ammonium)				June		
Si (silicate)				June		
Cl (chloride)				June		
Ca (calcium)				June		
Mg (magnesium)				June		
Na (sodium)				June		
K (potassium)				June		
Fe (iron)				June		Feb 93
Mn (manganese)				June		Feb 93
Ice and snow						
Water depth						
Water velocity						

Table C-2. Laboratory measurements performed on limnological samples from 1988 through 1996. Each laboratory processed samples or parameters between the dates listed. The precision of result reporting is shown in parentheses. Analytical techniques are described in the procedures manuals for the Waterways Experiment Station (WES) Environmental Laboratories and by the American Public Health Association et al. (1992).

	Laboratory		
Parameter and method	**WES–Vicksburg**	**WES–EauGalle**	**UMESC**
Total suspended solids: Gravimetric/105 °C	—	June 91–June 93 (1 µg/L)	June 93–Present (1 µg/L)
Volatile suspended solids: Gravimetric/550 °C	—	June 91–June 93 (1 µg/L)	June 93–Present (1 µg/L)
Chlorophyll *a*: Fluorometric-DMSO-acetone extraction	—	—	June 93–Present (1 µg/L)
Chlorophyll *a*: Spectrophotometric 90% acetone extraction	—	June 91–June 93 (1 µg/L)	June 93–Present (1 µg/L)
Total phosphorus: Automated/ persulfate/ascorbic acid	—	June 91–Jan. 94 (1 µg/L)	Jan. 94–Present (1 µg/L)
Soluble reactive phosphorus (H): Automated/ H_2SO_4 preservation, ascorbic acid	June 91–Dec. 93 (1 µg/L)	—	—
Soluble reactive phosphorus: Automated /frozen/ ascorbic acid	Jan. 94–Feb. 94 (1 µg/L)	—	Feb. 94–Present (1 µg/L)
Total soluble phosphorus Automated/persulfate/ascorbic acid	—	June 91–Apr. 93 (1 µg/L)	—
Total nitrogen: Automated/Devarda's alloy	—	June 91–Jan. 94 (0.01 mg/L)	Jan. 94–Present (0.01 mg/L)
Total soluble nitrogen: Automated/Devarda's Alloy	—	June 91–Apr. 93 (0.01 mg/L)	—
No_x: Automated Cd reduction, ion chromatography	June 91–Apr. 94 Automated Cd Reduction (0.01 mg/L)	—	Apr.–June 94: Cd Reduction June 94–Present: Ion C. (0.01 mg/L)
NH_x: Automated salicylate	June 91–Feb. 94 (1 µg/L)	—	Feb. 94–Present (1 µg/L)
Dissolved Si: Automated/molybdate	June 91–Feb. 94 (0.01 mg/L)	—	Mar. 94–Present (0.01 mg/L)
SO_4: Ion chromatography	—	—	Jan. 94–Present (0.1 mg/L)
Dissolved chloride: Automated Ferro-cyanide, ion chromatography	June 91–June 94: Automated FeCN (0.1 mg/L)	—	June 94–Present: IC (0.1 mg/L)
Dissolved calcium: Ion chromatography	—	—	Jan. 94–Present (0.1 mg/L)
Dissolved calcium: Atomic absorption	June 91–Oct. 93 (0.1 mg/L)	—	Oct. 93–1 Jan. 94 (0.1 mg/L)

Table C-2. Continued.

Parameter and method	Laboratory		
	WES–Vicksburg	WES–EauGalle	UMESC
Dissolved magnesium: Ion chromatography			Jan. 94–Present (0.1 mg/L)
Dissolved sodium: Ion chromatography			Jan. 94–Present (0.1 mg/L)
Dissolved potassium: Atomic absorption	June 91–Oct. 93 (0.1 mg/L)	—	Oct. 93–Present (0.1 mg/L)
Dissolved iron: Atomic absorption	June 91–Apr. 93 (0.01 mg/L)	—	—
Dissolved manganese: Atomic absorption	June 91–Apr. 93 (0.01 mg/L)	—	—

Appendix D. Water Quality Sample Collection

Details of sample collection are important to ensure that field activities comply with the monitoring design and are producing unbiased results. The figures in Appendix D focus on site visits and sample collection times. Consistent differences in sampling times among sites, over time, or among field stations can introduce serious bias into measurements influenced by daily cycles (e.g., temperature and dissolved oxygen). Gaps in the data record can also have important ramifications for data interpretation and are therefore documented here.

Table D-1. Fixed-site sampling visit exceptions from 1993 to 1996 at the Lake City Field Station. Table entries are keyed to numbered points on Figure D-1.

Figure code	Begin date	Site visits	Comment
1	05/21/93	4	In situ Lake Pepin samples only.
2	06/04/93	4	In situ Lake Pepin samples only.
3	06/18/93	4	In situ Lake Pepin samples only.
4	07/02/93	4	In situ Lake Pepin samples only.
5	07/16/93	4	In situ Lake Pepin samples only.
6	08/13/93	5	In situ Lake Pepin samples only.
7	08/27/93	4	In situ Lake Pepin samples only.
8	09/10/93	4	In situ Lake Pepin samples only.
9	12/24/93	0	Unable to sample for logistical reasons.
10	01/28/94	0	Unable to sample for logistical reasons.
11	06/03/94	4	In situ Lake Pepin samples only.
12	06/17/94	4	In situ Lake Pepin samples only.
13	07/01/94	4	In situ Lake Pepin samples only.
14	07/15/94	4	In situ Lake Pepin samples only.
15	08/12/94	4	In situ Lake Pepin samples only.
16	08/26/94	4	In situ Lake Pepin samples only.
17	09/09/94	4	In situ Lake Pepin samples only.
18	09/23/94	4	In situ Lake Pepin samples only.
19	10/14/94	0	Sample schedule interrupted by stratified random sampling.
20	12/16/94	0	Unable to sample for logistical reasons.
21	02/03/95	0	Sample schedule interrupted by stratified random sampling.
22	05/12/95	4	In situ Lake Pepin samples only.
23	05/26/95	4	In situ Lake Pepin samples only.
24	06/09/95	4	In situ Lake Pepin samples only.
25	06/23/95	4	In situ Lake Pepin samples only.
26	07/07/95	4	In situ Lake Pepin samples only.
27	07/21/95	4	In situ Lake Pepin samples only.
28	08/18/95	4	In situ Lake Pepin samples only.
29	09/01/95	4	In situ Lake Pepin samples only.
30	09/15/95	4	In situ Lake Pepin samples only.
31	09/29/95	4	In situ Lake Pepin samples only.
32	12/15/95	0	Unable to sample for logistical reasons.
33	01/05/96	1	Unable to sample for logistical reasons.
34	02/09/96	0	Sample schedule interrupted by stratified random sampling.
35	03/08/96	0	Unable to sample for logistical reasons.
36	05/17/96	4	In situ Lake Pepin samples only.
37	05/31/96	4	In situ Lake Pepin samples only.
38	06/14/96	4	In situ Lake Pepin samples only.
39	06/28/96	4	In situ Lake Pepin samples only.
40	07/12/96	4	In situ Lake Pepin samples only.
41	08/09/96	4	In situ Lake Pepin samples only.
42	08/23/96	4	In situ Lake Pepin samples only.
43	09/06/96	4	In situ Lake Pepin samples only.
44	09/20/96	4	In situ Lake Pepin samples only.
45	11/08/96	0	Unable to sample for logistical reasons.
46	11/29/96	0	Unable to sample for logistical reasons.

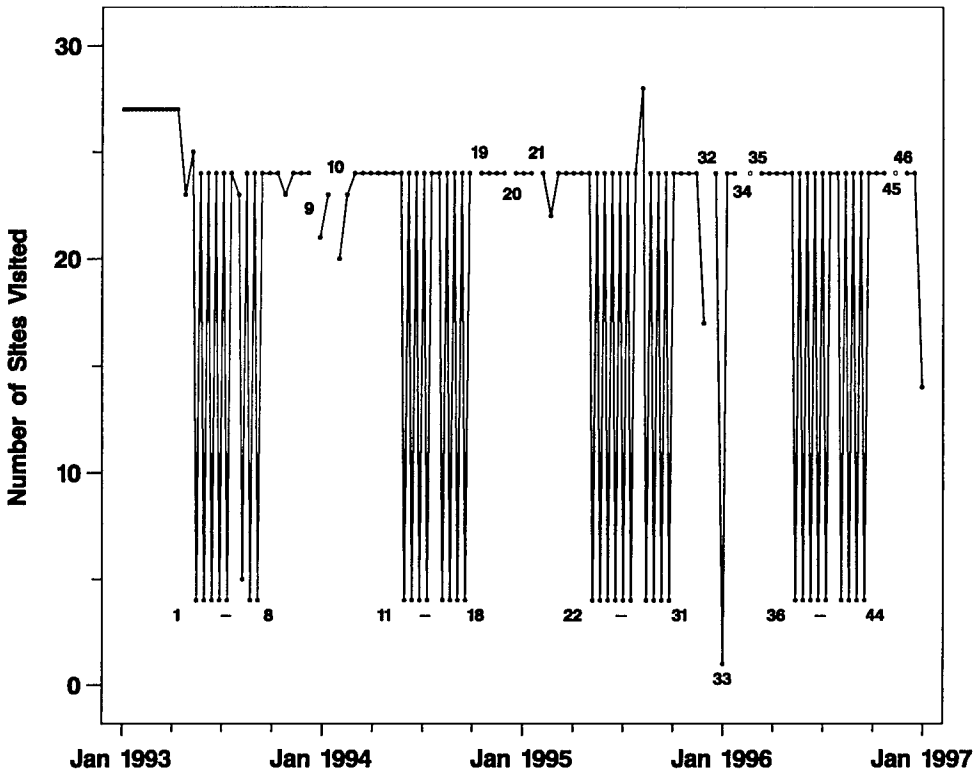

Figure D-1. Number of weekly fixed-site visits from January 1993 through December 1996 by the Lake City Field Station. Numbered points are weeks that differ by more than one standard deviation from the mean site visits per week and are described in Table D-1.

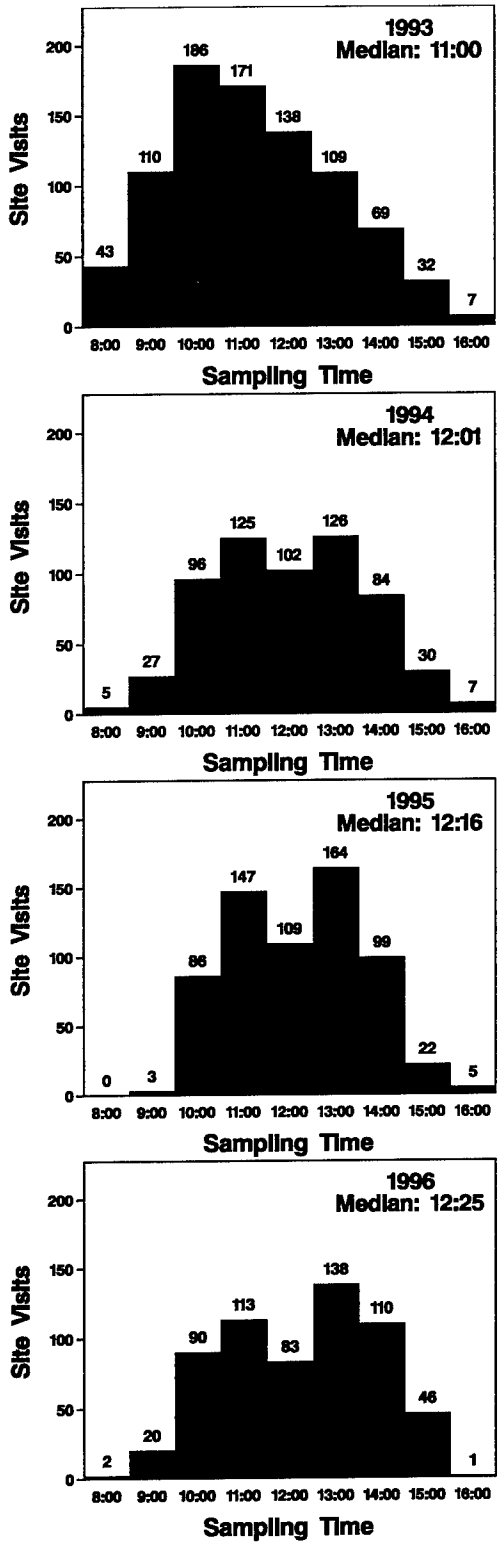

Figure D-2. Distribution of sample collection times at fixed sites from 1993 to 1996. Each bar is labeled with the number of site visits within each hourly interval.

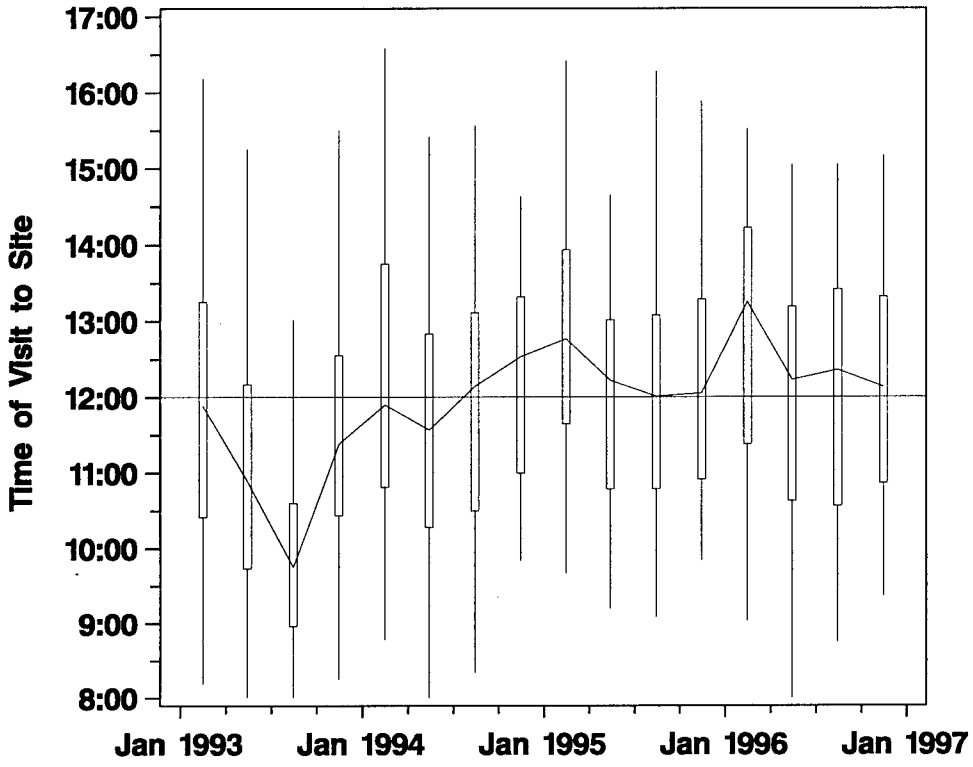

Figure D-3. Trend in fixed-site sample collection times by quarter, from 1993 to 1996. The midpoint (median) for each quarter is joined by a solid line. The box extending above and below the median denotes the 90th and 10th percentiles, respectively. The vertical line extends above and below the box to the maximum and minimum values for the quarter.

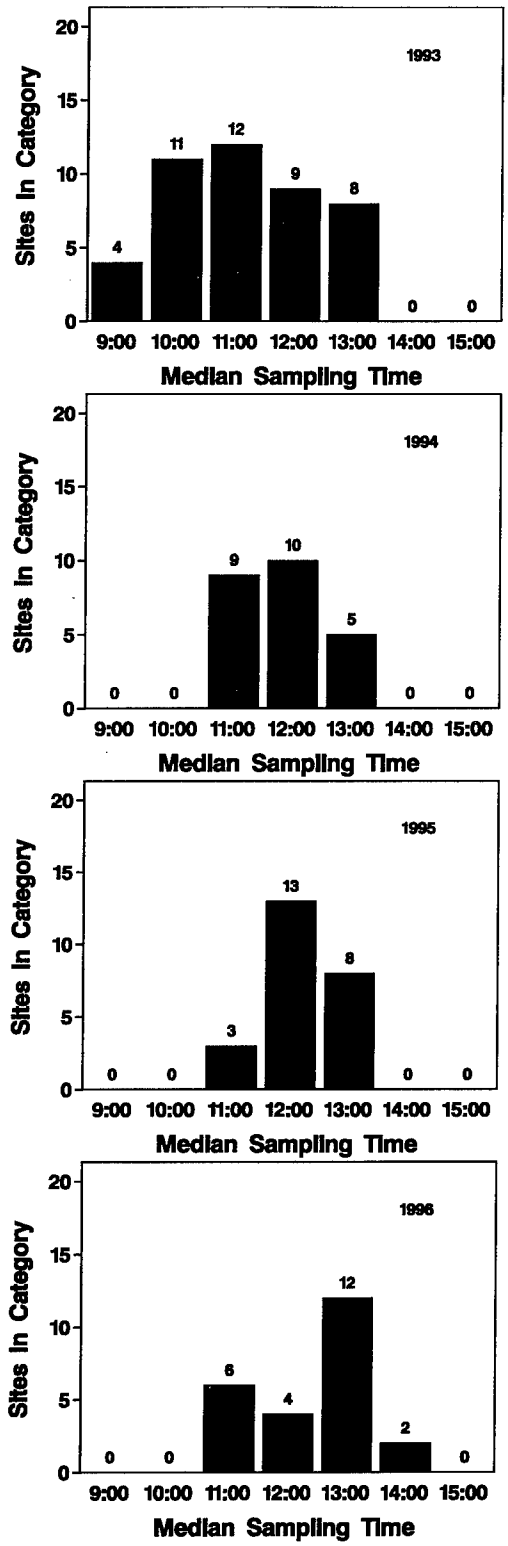

Figure D-4. Distribution of fixed sites by median sampling time at each site from 1993 to 1996.

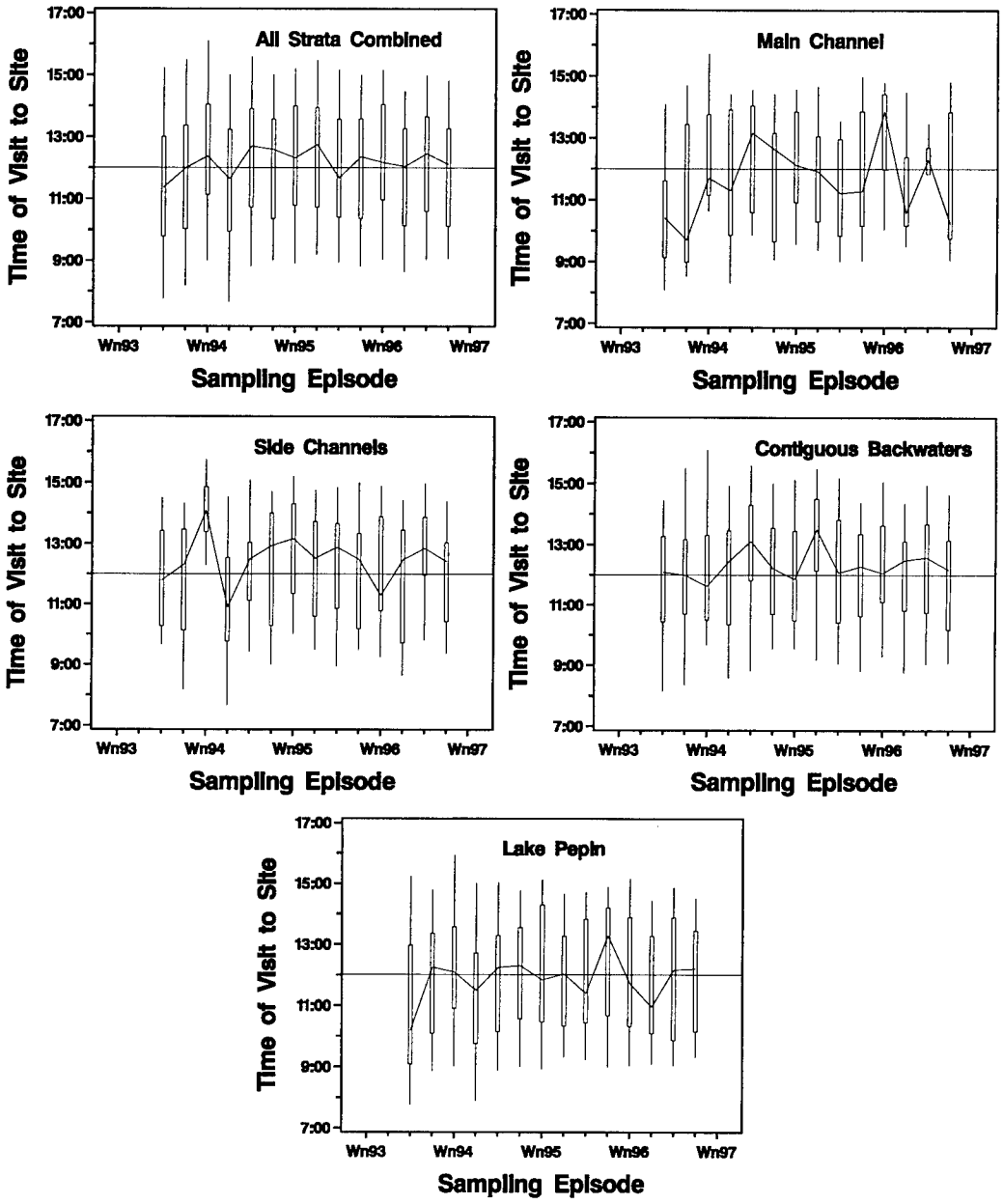

Figure D-5. Water quality sample collection times in each sampling strata during each episode of stratified random sampling from 1993 to 1996. The midpoints (median) of the episodes are joined by a solid line. The box extending above and below the median denotes the 90th and 10th percentiles, respectively. The vertical line extends above and below each box to the maximum and minimum values for the episode.

Appendix E. Fixed-site Sampling Data: January 1993–December 1996

In Appendix E, we summarize the fixed-site monitoring data in both tabular and graphic forms. The tables contain annual statistics for each fixed site divided into two parameter groups: (1) physical and biological measurements (Table E-1), and (2) chemical data (major anions, cations, and plant nutrients; Table E-2). Within each parameter group, the data are divided by sampling depth into three groups (surface, middepth, and bottom). Chemical measurements are typically collected only at the surface and near-bottom. The majority of all measurements are in the near-surface category. Refer to Appendix A for descriptions and locations of the individual sampling sites. Sites with less than five visits during the 1993–1996 period are excluded from these summaries.

The figures (E-1, E-2) of the fixed-site data are in two formats. For sampling on the Mississippi (or Illinois) River main stems, the figures generally include separate plots of monthly means from main channel and impounded sites near the upstream and downstream ends of the reach or pool (where available). For tributary sampling, only a single plot is provided. Unlike the summary tables, these figures combine data from all sampling depths.

Data that have been flagged as questionable in the Long Term Resource Monitoring Program database are excluded from this summary. Values that are below detection are indicated by the detection limit preceded by a negative sign. Below-detection values are included in the determination of minima, maxima, and medians, but in the calculation of means and standard deviations, values below detection have been replaced by a value equal to half the detection limit. The Secchi transparency data in this report do not include observations where Secchi transparency exceeded the water column depth. High transparency conditions are thus under-represented.

Table E-1. Annual summaries (1993–1996) of physical measurements at fixed sites grouped into four categories: near-surface (less than or equal to 0.2 m below the surface), middepth, near-bottom (less than or equal to 0.2 m above the substrate), and miscellaneous depths.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1993 Near-surface measurements:																			
CH00.1M	Mean	0.2	2.12	0.53	100	42	100	9	8.53	10.8	89	176	7.9	86.8	9	14.3	5.1	13.1	—
	Median	0.2	1.99	0.49	100	40	100	5	3.95	11.7	91	159	7.9	93	6	12.5	5.1	13.5	—
	Minimum	0.2	0.71	0.13	100	29	100	3	0	5.5	64	91	7.2	40	3	2.6	1.7	2.99	—
	Maximum	0.2	4	1.06	100	58	100	24	22.8	13.6	109	460	8.9	143	25	40.1	9	33.2	—
	Std. dev.	0	0.84	0.26	0	8.15	0	7.5	8.78	2.3	9.44	78.2	0.34	23.7	6.53	10	1.84	8.7	—
	N obs.	30	30	12	9	9	9	9	30	30	30	30	30	24	30	16	16	16	0
CN00.1M	Mean	0.2	2.48	0.7	100	38	100	13	8.32	10.9	88	632	8.3	73	18	33.3	8.2	—	—
	Median	0.2	1.94	0.64	100	40	100	8	4.5	12.4	93	604	8.3	73	12	23.5	6.6	—	—
	Minimum	0.2	1	0.41	100	29	100	6	0	4.8	55	425	7.8	25	2	5.8	1.9	—	—
	Maximum	0.2	5	1.56	100	43	100	25	23.8	14.4	117	851	8.7	130	125	125	20.2	—	—
	Std. dev.	0	1.28	0.27	0	5.59	0	7.9	8.58	3.1	13	117	0.22	30.4	24.2	29.7	5.16	—	—
	N obs.	32	32	13	5	5	5	5	32	32	32	31	32	25	32	16	16	0	0
M738.2F	Mean	0.2	—	—	—	—	—	—	13.9	9.79	91	529	8.3	—	18	21.6	6.3	12.9	—
	Median	0.2	—	—	—	—	—	—	16.5	9.5	91	524	8.4	—	15	22.3	6.8	12	—
	Minimum	0.2	—	—	—	—	—	—	0	5.5	63	445	7.9	—	5	3.2	2.7	4.49	—
	Maximum	0.2	—	—	—	—	—	—	23.9	15.8	114	655	8.8	—	41	47.4	8.6	24.3	—
	Std. dev.	0	—	—	—	—	—	—	8.09	2.95	12.8	46.6	0.26	—	10.9	13.1	2.09	5.93	—
	N obs.	17	0	0	0	0	0	0	17	17	17	17	17	0	17	15	15	15	0
M742.6B	Mean	0.2	1.47	1.08	—	—	—	—	13.7	11.5	107	533	8.5	50.6	25	30.9	10	30.5	—
	Median	0.2	1.5	1.2	—	—	—	—	16.1	11.7	103	533	8.5	41	28	34.7	10.1	21.7	—
	Minimum	0.2	1.2	0.53	—	—	—	—	1	5.2	59	444	7.9	28	5	2.6	2.4	3.74	—
	Maximum	0.2	2.2	1.78	—	—	—	—	24	18.6	161	664	9	153	44	46.8	22.3	98.1	—
	Std. dev.	0	0.26	0.44	—	—	—	—	8.04	3.51	26.4	51.4	0.27	31.9	10.7	15.3	5.09	27.4	—
	N obs.	18	17	15	0	0	0	0	18	18	18	18	18	17	18	16	16	16	0
M742.8D	Mean	0.2	2.07	1.23	10	8	0	0	13.6	10.7	98	535	8.4	53.5	25	30.4	8.9	21.2	—
	Median	0.2	2	1.05	10	8	0	0	16	9.95	97	540	8.5	42	27	29.9	8.3	15.7	—
	Minimum	0.2	1.8	0.63	10	8	0	0	1	5.4	61	450	7.9	20	5	2.9	2.5	3.74	—
	Maximum	0.2	2.7	1.8	10	8	0	0	23.8	18.4	136	632	8.9	159	55	76.6	25.3	110	—
	Std. dev.	0	0.23	0.41	—	—	—	—	8.08	3.48	19.1	40.5	0.28	36.5	14	18.7	5.2	25.1	—
	N obs.	18	17	15	1	1	1	1	18	18	18	18	18	17	18	16	16	16	0
M745.2L	Mean	0.2	2.02	0.55	—	—	—	—	14.8	9.59	91	531	8.3	62	19	25.1	6.5	11.4	—
	Median	0.2	2	0.58	—	—	—	—	16.5	9.1	93	530	8.4	54.5	16	24.5	6.9	9.67	—
	Minimum	0.2	1.3	0.27	—	—	—	—	0.8	5.7	65	415	7.9	34	5	3.6	2.4	3.74	—
	Maximum	0.2	2.6	0.85	—	—	—	—	24	14.2	124	595	8.7	133	39	58.2	11.7	30.7	—
	Std. dev.	0	0.33	0.2	—	—	—	—	7.3	2.9	17	42.3	0.27	27.1	10.1	15.2	2.37	6.75	—
	N obs.	17	17	14	0	0	0	0	17	17	17	17	17	16	17	15	15	15	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1993 Near-surface measurements:																			
M746.9Y	Mean	0.2	3.93	—	80	12	0	0	14.2	9.57	89	426	8.2	80.3	14	17.5	5.8	11.7	—
	Median	0.2	3.85	—	80	12	0	0	16.6	9.35	92	441	8.4	70.5	13	17.9	5.5	10.7	—
	Minimum	0.2	3	—	80	12	0	0	0.3	5.4	62	103	7.2	51	4	3.3	2.5	2.14	—
	Maximum	0.2	4.9	—	80	12	0	0	24.2	14.2	105	600	8.6	171	22	32.2	12.9	24.4	—
	Std. dev.	0	0.52	—	—	—	—	—	7.9	2.86	13.2	99.2	0.37	35.5	5.4	8.78	2.39	6.16	—
	N obs.	18	18	0	1	1	1	1	18	18	18	18	18	18	18	16	16	16	0
M747.3R	Mean	0.2	1.69	1.07	—	—	—	—	14.7	9.43	90	533	8.3	64.9	22	31.8	7.9	10.2	—
	Median	0.2	1.5	1.05	—	—	—	—	16.2	8.8	90	530	8.3	58.5	16	23	6.6	9.62	—
	Minimum	0.2	1.3	0.48	—	—	—	—	0.5	5.9	69	440	7.8	33	5	3.6	2.5	2.81	—
	Maximum	0.2	2.5	1.75	—	—	—	—	23.9	14.1	119	595	8.7	144	52	83.3	19.3	24.8	—
	Std. dev.	0	0.37	0.39	—	—	—	—	7.27	2.71	14.1	39.7	0.26	30.4	14.4	23.5	4.59	5.86	—
	N obs.	17	17	17	0	0	0	0	17	17	17	17	17	16	17	15	15	15	0
M752.8Y	Mean	0.2	6.75	—	—	—	—	—	14	9.6	89	562	8.4	73.5	14	15.9	5.3	10.4	—
	Median	0.2	7.9	—	—	—	—	—	16.1	9	88	554	8.4	68	15	18	5.4	9.55	—
	Minimum	0.2	1.5	—	—	—	—	—	0.1	5.2	61	478	7.8	44	5	2.6	2	2.67	—
	Maximum	0.2	10.5	—	—	—	—	—	24	14.6	130	664	9.1	160	25	24.3	8.4	31.7	—
	Std. dev.	0	2.69	—	—	—	—	—	7.99	3.21	18.9	51.5	0.33	29.9	5.82	7.1	1.77	7.05	—
	N obs.	18	17	0	0	0	0	0	18	18	18	18	18	17	18	16	16	16	0
M752.8Z	Mean	0.2	3.12	—	—	—	—	—	13.6	9.46	87	363	8.1	67.8	14	19.9	5.7	12.1	—
	Median	0.2	2.7	—	—	—	—	—	16	8.9	90	377	8.2	62	15	23.3	5.9	11.9	—
	Minimum	0.2	1.8	—	—	—	—	—	0	4.8	53	109	7.2	54	5	3.3	2.4	2.14	—
	Maximum	0.2	5.8	—	—	—	—	—	23.9	13.8	108	580	8.6	135	20	34.2	7.9	29.9	—
	Std. dev.	0	1.19	—	—	—	—	—	8.03	2.98	15	102	0.38	19.7	4.71	9.25	1.69	7.54	—
	N obs.	18	17	0	0	0	0	0	18	18	18	18	17	17	18	16	16	16	0
M753.1X	Mean	0.2	2.41	0.44	87.5	10	0	0	14.5	9.78	92	561	8.4	78.5	13	15.5	5.8	11.1	—
	Median	0.2	2	0.36	87.5	10	0	0	16.7	9.55	92	559	8.4	68	13	15.5	5.7	10.1	—
	Minimum	0.2	1.5	0.11	75	2	0	0	0.1	5.9	68	480	7.9	40	4	3	2.2	4.37	—
	Maximum	0.2	7.7	1	100	18	0	0	25	15	146	670	8.9	169	27	32.3	14.6	31.1	—
	Std. dev.	0	1.49	0.3	17.7	11.3	0	0	8.27	2.99	18.3	50.8	0.28	32	6.76	7.85	2.76	6.52	—
	N obs.	18	18	14	2	2	2	2	18	18	18	18	18	17	18	16	16	16	0
M753.2S	Mean	0.2	3.35	0.06	100	40	98	9	0.9	12.7	89	552	8	170	5	7	1.7	3.23	—
	Median	0.2	3.27	0.03	100	42	100	7	0	12.6	88	516	8	175	3	1.2	1.2	4.58	—
	Minimum	0.2	3.16	0.01	100	23	75	3	0	11	80	406	7.8	42	2	1	1	-1	—
	Maximum	0.2	3.8	0.29	100	50	100	22	5	14.3	104	733	8.2	290	23	18.9	2.8	6.11	—
	Std. dev.	0	0.21	0.09	0	8.84	7.54	5.7	1.57	1.16	7.64	91	0.14	69.5	6.36	10.3	0.99	3.74	—
	N obs.	14	14	10	11	11	11	11	14	14	14	14	14	14	14	3	3	3	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
										1993 Near-surface measurements:								
M753.2V	Mean	0.2	2.18	0.02	100	44	100	10	0.88	12.8	89	544	8	49	5	—	—	—	—
	Median	0.2	1.26	0.01	100	45	100	10	0	12.4	86	510	8	49	3	—	—	—	—
	Minimum	0.2	0.79	0	100	24	100	1	0	10.6	79	403	7.7	45	1	—	—	—	—
	Maximum	0.2	13.5	0.09	100	60	100	22	5.5	15.3	105	663	8.2	53	24	—	—	—	—
	Std. dev.	0	3.39	0.03	0	12.1	0	5.9	1.68	1.5	9.28	76.7	0.15	5.66	6.56	—	—	—	—
	N obs.	13	13	10	9	9	9	9	13	13	13	13	13	2	13	0	0	0	0
M757.2Z	Mean	0.2	3.91	0.31	65	12	0	0	14.4	9.52	88	315	8.1	84.9	11	13.1	4.9	13.2	—
	Median	0.2	3.8	0.29	65	12	0	0	16	8.4	85	353	8.2	73.5	12	14.6	4.8	11.2	—
	Minimum	0.2	3.4	0.05	30	7	0	0	0.1	5.5	62	86	7	50	4	2.3	2.6	1.66	—
	Maximum	0.2	4.9	0.72	100	17	0	0	24.8	15.3	129	568	8.8	188	18	19	7.8	44.9	—
	Std. dev.	0	0.42	0.23	49.5	7.07	0	0	8.35	3.1	14.8	133	0.5	33.4	4.05	5.06	1.41	9.61	—
	N obs.	18	18	14	2	2	2	2	18	17	17	18	18	18	18	16	15	16	0
M757.4O	Mean	0.2	1.51	0.01	100	43	88	10	0.63	13.2	92	576	8	116	5	—	—	—	—
	Median	0.2	1.4	0	100	46	100	6	0	12.4	90	554	8	139	3	—	—	—	—
	Minimum	0.2	1.18	0	100	25	0	0	0	11.2	77	494	7.8	51	2	—	—	—	—
	Maximum	0.2	2.4	0.02	100	55	100	39	5.8	19.8	136	739	8.5	146	20	—	—	—	—
	Std. dev.	0	0.31	0.01	0	10.3	31.1	10	1.6	2.49	16.9	78	0.22	39.8	4.93	—	—	—	—
	N obs.	13	13	9	12	12	12	12	13	13	13	13	13	6	13	0	0	0	0
M757.5O	Mean	0.2	0.87	0.01	100	41	83	8	0.64	13.4	94	572	8.1	48	5	—	—	—	—
	Median	0.2	0.76	0.01	100	40	100	7	0.1	12.6	87	528	8	48	3	—	—	—	—
	Minimum	0.2	0.66	0	100	32	0	0	0	11.2	77	493	7.8	48	2	—	—	—	—
	Maximum	0.2	1.8	0.06	100	52	100	25	5.8	19.8	139	712	8.4	48	20	—	—	—	—
	Std. dev.	0	0.32	0.02	0	7.61	38.9	7.1	1.58	2.8	19.4	77.9	0.21	—	4.85	—	—	—	—
	N obs.	13	13	9	12	12	12	12	13	13	13	13	13	1	13	0	0	0	0
M758.6X	Mean	0.2	1.07	0.02	100	38	100	9	0.32	8.41	58	387	7.5	68.3	10	—	—	—	—
	Median	0.2	1.01	0.03	100	39	100	5	0.05	7.75	53	416	7.4	65.5	10	—	—	—	—
	Minimum	0.2	0.88	0	100	26	100	2	0	6.9	47	111	7.4	50	5	—	—	—	—
	Maximum	0.2	1.9	0.03	100	49	100	24	3	11.3	84	461	7.6	112	13	—	—	—	—
	Std. dev.	0	0.27	0.01	0	7.67	0	7	0.85	1.44	11.2	91.8	0.06	16.2	2.04	—	—	—	—
	N obs.	12	12	9	11	11	11	11	12	12	12	12	12	12	12	0	0	0	0
M758.6Y	Mean	0.2	1.64	0.04	100	31	91	8	0.38	12.1	84	411	7.8	115	5	1.4	1.2	1.6	—
	Median	0.2	1.64	0.04	100	34	100	6	0	12	82	440	7.9	115	4	1.4	1.2	1.6	—
	Minimum	0.2	1.24	0.02	100	10	0	0	0	10.8	74	97	7.6	75	3	1.4	1.1	-1	—
	Maximum	0.2	2.1	0.08	100	45	100	21	3.1	13.7	94	550	8	150	13	1.4	1.2	4.2	—
	Std. dev.	0	0.18	0.02	0	11.9	30.2	7.1	0.87	0.85	5.83	128	0.13	22.4	2.81	0	0.07	3.68	—
	N obs.	13	13	10	11	11	11	11	13	13	13	13	13	11	13	2	2	2	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1993 Near-surface measurements:																			
M760.7O	Mean	0.2	1.97	0.25	5	8	0	0	1.23	12.6	89	525	8	131	6	—	—	—	—
	Median	0.2	1.87	0.13	5	8	0	0	0.2	12.2	88	511	8	107	3	—	—	—	—
	Minimum	0.2	1	0.07	5	8	0	0	0	10.8	80	405	7.8	49	2	—	—	—	—
	Maximum	0.2	3.77	0.74	5	8	0	0	5.9	14.8	108	643	8.3	260	24	—	—	—	—
	Std. dev.	0	0.88	0.24	—	—	—	—	1.73	1.26	8.72	73	0.17	96.6	6.21	—	—	—	—
	N obs.	13	13	12	1	1	1	1	13	13	13	13	13	4	13	0	0	0	0
M761.5E	Mean	0.2	3.22	0.4	—	—	—	—	1.28	12.6	89	515	8	207	6	6.6	1.8	2.91	—
	Median	0.2	3.05	0.29	—	—	—	—	0.8	12.6	88	510	7.9	230	3	1.6	1.2	4.2	—
	Minimum	0.2	2.5	0.13	—	—	—	—	0	10.6	79	400	7.7	41	3	-0.1	-0.1	-1	—
	Maximum	0.2	4.8	1.13	—	—	—	—	5.8	14.8	104	621	8.2	280	23	18.2	4.3	5.54	—
	Std. dev.	0	0.67	0.29	—	—	—	—	1.67	1.29	8.29	68.4	0.16	76.4	6.05	10.1	2.26	3.45	—
	N obs.	13	13	12	0	0	0	0	13	13	13	13	13	13	13	3	3	3	0
M764.3A	Mean	0.2	7.06	—	—	—	—	—	14.8	9.6	92	564	8.3	101	12	33.1	4.6	9.65	—
	Median	0.2	7	—	—	—	—	—	16.8	8.45	86	563	8.3	87	10	9.6	4.5	9.48	—
	Minimum	0.2	4.8	—	—	—	—	—	0.2	6	69	475	7.9	48	4	2.7	2.2	4.37	—
	Maximum	0.2	8.8	—	—	—	—	—	25.2	15.8	168	673	9	221	25	383	7.7	17.7	—
	Std. dev.	0	1.1	—	—	—	—	—	8.1	3.26	24.6	53.2	0.26	47.8	6.17	93.4	1.53	4.21	—
	N obs.	18	18	0	0	0	0	0	18	18	18	18	18	18	18	16	16	16	0
M766.0B	Mean	0.2	11.6	—	100	34	100	9	0.97	13.5	94	669	8.1	204	4	—	—	—	—
	Median	0.2	11.4	—	100	38	100	9	0.75	13.2	92	665	8	220	2	—	—	—	—
	Minimum	0.2	11	—	100	20	100	3	0	10.3	79	444	7.9	43	2	—	—	—	—
	Maximum	0.2	13.7	—	100	43	100	17	6.1	19	130	770	8.4	379	15	—	—	—	—
	Std. dev.	0	0.69	—	0	8	0	4.8	1.67	2.25	14	83.4	0.13	102	3.68	—	—	—	—
	N obs.	13	12	0	11	11	11	11	12	12	12	12	12	12	12	0	0	0	0
M766.0I	Mean	0.2	6.82	—	100	45	99	11	11.7	10.3	91	587	8.3	132	9	9.7	5.5	8.93	—
	Median	0.2	7	—	100	47	100	10	13.6	10.2	90	575	8.2	107	7	7.3	4.6	10.5	—
	Minimum	0.2	5.26	—	100	20	90	1	0	1.1	8	451	7.9	44	1	-0.1	-0.1	1.25	—
	Maximum	0.2	9.1	—	100	64	100	19	26	17	133	734	8.7	320	29	26.8	25.3	16.4	—
	Std. dev.	0	1.18	—	0	12.5	2.89	4.8	10.2	3.59	20.2	72.9	0.21	76.3	6.88	7.56	5.68	4.74	—
	N obs.	37	36	0	12	12	12	12	36	36	36	36	35	36	36	17	16	16	0
M766.0O	Mean	0.2	2.17	—	100	47	100	13	0.67	14.3	99	651	8.2	130	4	—	—	—	—
	Median	0.2	1.96	—	100	48	100	15	0.15	13.7	94	659	8.1	128	3	—	—	—	—
	Minimum	0.2	1.91	—	100	30	100	6	0	10.3	80	449	7.9	61	2	—	—	—	—
	Maximum	0.2	4.55	—	100	60	100	18	6.4	18.6	128	741	8.5	178	16	—	—	—	—
	Std. dev.	0	0.75	—	0	8.72	0	3.7	1.81	2.46	15.5	72.8	0.2	42.9	3.94	—	—	—	—
	N obs.	13	12	0	11	11	11	11	12	12	12	12	12	7	12	0	0	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1993 Near-surface measurements:																			
M771.2P	Mean	0.2	9.4	—	100	22	90	1	16.8	9.09	91	550	8.3	69.4	16	15.2	6.8	14	—
	Median	0.2	9.4	—	100	22	90	1	18.9	8.4	88	552	8.3	58	15	13.2	5.8	11.8	—
	Minimum	0.2	8.1	—	100	22	90	1	0.5	5.5	65	424	7.7	37	5	4	3	4.99	—
	Maximum	0.2	11.3	—	100	22	90	1	25.9	14.8	131	684	8.7	150	32	39.7	25.1	41.9	—
	Std. dev.	0	0.87	—	—	—	—	—	7.6	2.73	17.1	63.3	0.24	32.2	7.78	9.29	5.5	9.55	—
	N obs.	26	26	0	1	1	1	1	26	26	26	26	25	26	26	14	14	15	0
M775.6L	Mean	0.2	3.46	—	100	44	93	8	1.26	12.9	91	634	8.1	163	5	—	—	—	—
	Median	0.2	2.96	—	100	47	100	9	0.6	13.3	92	650	8.1	185	2	—	—	—	—
	Minimum	0.2	2.77	—	100	28	20	3	0	10.2	80	433	7.9	41	2	—	—	—	—
	Maximum	0.2	6.3	—	100	52	100	14	7	14	98	742	8.2	239	30	—	—	—	—
	Std. dev.	0	1.11	—	0	6.97	23.1	3.7	2.09	1.19	5.43	82	0.09	59.5	7.9	—	—	—	—
	N obs.	14	14	0	12	12	12	12	14	14	14	14	14	12	14	0	0	0	0
M775.6Q	Mean	0.2	9.37	—	100	44	86	8	11.2	10.5	91	584	8.2	105	15	18.4	6.3	14.2	—
	Median	0.2	9.28	—	100	45	100	7	11.6	10.8	89	574	8.2	60.5	15	19	7	13.5	—
	Minimum	0.2	8.16	—	100	23	0	0	0	5.7	64	431	7.6	31	2	1.6	-0.1	2.67	—
	Maximum	0.2	11.5	—	100	55	100	16	25.8	18.6	137	795	8.7	320	38	39.4	12.2	52.4	—
	Std. dev.	0	1.01	—	0	9.87	34	4.3	9.7	3.15	15.6	80.5	0.24	80.6	11.5	11.2	3.09	11.4	—
	N obs.	40	40	0	13	13	13	13	40	40	40	40	39	40	40	19	19	19	0
M775.6Y	Mean	0.2	4.64	—	100	44	93	10	0.89	13.5	94	611	8.1	181	5	—	—	—	—
	Median	0.2	4.67	—	100	47	100	10	0.1	13.5	92	637	8.1	172	3	—	—	—	—
	Minimum	0.2	2.96	—	100	28	20	3	0	10.4	81	417	8	49	2	—	—	—	—
	Maximum	0.2	6.5	—	100	55	100	16	6.1	21	144	660	8.3	351	25	—	—	—	—
	Std. dev.	0	0.76	—	0	8.98	23.1	3.7	1.99	2.53	15.5	72.3	0.1	89.5	6.77	—	—	—	—
	N obs.	14	14	0	12	12	12	12	14	14	14	14	14	14	14	0	0	0	0
M781.2E	Mean	0.2	7.41	—	100	30	100	7	1.44	12.9	91	630	8	183	6	—	—	—	—
	Median	0.2	7.1	—	100	30	100	5	0.65	13.2	91	643	8	184	3	—	—	—	—
	Minimum	0.2	6.47	—	100	22	100	2	0	10	79	455	8	40	2	—	—	—	—
	Maximum	0.2	9.5	—	100	40	100	15	6.1	15	103	720	8.2	259	30	—	—	—	—
	Std. dev.	0	0.98	—	0	5.21	0	4.5	2.06	1.49	7.22	75.1	0.07	69.9	8.48	—	—	—	—
	N obs.	12	12	0	9	9	9	9	12	12	12	12	11	12	11	0	0	0	0
M781.2O	Mean	0.2	6.15	—	100	48	92	11	11.1	10.8	93	578	8.2	103	18	25.1	7.1	16.1	—
	Median	0.2	6.1	—	100	52	100	12	12.2	10.5	91	571	8.2	57.5	17	23	8.3	15.9	—
	Minimum	0.2	4.95	—	100	26	0	0	0	5.9	66	415	7.9	27	2	1	-0.1	1.5	—
	Maximum	0.2	8.3	—	100	60	100	17	25.1	16.9	139	737	8.9	294	51	60.7	14.9	53.5	—
	Std. dev.	0	1.04	—	0	10.5	27.7	4.4	9.74	3.39	16.1	82.8	0.23	81.3	13.9	16.2	3.65	12.7	—
	N obs.	40	40	0	13	13	13	13	40	40	40	40	39	40	40	19	19	19	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
										1993 Near-surface measurements:								
M781.2X	Mean	0.2	2.13	—	100	47	100	10	0.92	14	97	619	8.1	130	5	—	—	—	—
	Median	0.2	1.82	—	100	47	100	10	0.05	14.6	100	651	8.1	153	3	—	—	—	—
	Minimum	0.2	1.74	—	100	28	100	4	0	10.5	83	420	7.9	33	2	—	—	—	—
	Maximum	0.2	4.2	—	100	61	100	16	6	17.1	119	715	8.5	172	26	—	—	—	—
	Std. dev.	0	0.84	—	0	9.48	0	4	1.98	2.07	12	84.9	0.15	51.1	6.9	—	—	—	—
	N obs.	14	14	0	12	12	12	12	14	14	14	14	14	9	14	0	0	0	0
M786.1S	Mean	0.2	1.29	—	93.3	31	87	7	1.69	13.8	99	607	8.1	42.5	7	—	—	—	—
	Median	0.2	0.93	—	100	33	100	7	0.75	14.3	99	619	8.1	42.5	4	—	—	—	—
	Minimum	0.2	0.8	—	40	5	0	0	0	10.5	82	442	8	26	3	—	—	—	—
	Maximum	0.2	3.4	—	100	40	100	16	5.1	16.3	118	719	8.4	59	36	—	—	—	—
	Std. dev.	0	0.9	—	20	10.9	33.2	4.6	2	1.82	12	90.9	0.12	23.3	9.73	—	—	—	—
	N obs.	12	12	0	9	9	9	9	12	12	12	12	12	2	12	0	0	0	0
M786.2C	Mean	0.2	6.34	—	—	—	—	—	14.5	9.2	86	575	8.3	61.2	29	42.3	9.6	16.7	—
	Median	0.2	6.25	—	—	—	—	—	16	8.6	86	587	8.3	45	29	52.9	9.7	15.8	—
	Minimum	0.2	5.2	—	—	—	—	—	1	5.5	62	469	7.8	30	5	4.7	2.3	3.74	—
	Maximum	0.2	8.9	—	—	—	—	—	25.2	14	102	681	8.6	174	56	63.2	16.1	39.7	—
	Std. dev.	0	1.09	—	—	—	—	—	7.9	2.85	12.2	51.5	0.23	40	15.4	20.4	3.85	10.1	—
	N obs.	18	18	0	0	0	0	0	18	18	18	17	18	18	17	16	16	16	0
M786.5D	Mean	0.2	3.24	—	100	13	0	0	14.3	9.43	88	562	8.3	63	26	40.3	9.9	17.1	—
	Median	0.2	3.15	—	100	13	0	0	16	8.55	88	569	8.3	42	27	48.2	10.2	17.8	—
	Minimum	0.2	2.1	—	100	13	0	0	0.1	5.6	64	461	7.8	32	6	4.9	2.8	5.61	—
	Maximum	0.2	4.9	—	100	13	0	0	25.1	16.1	110	692	8.8	193	44	61.7	15.7	38.2	—
	Std. dev.	0	0.86	—	—	—	—	—	8.06	2.99	12.3	64.5	0.25	44.2	14.4	20.4	3.9	9.4	—
	N obs.	18	18	0	1	1	1	1	18	18	18	18	18	18	17	16	16	16	0
M787.9H	Mean	0.2	1.15	0.09	95.6	22	81	9	1.91	13.2	95	622	8	52	9	23.1	3.7	4.45	—
	Median	0.2	0.85	0.06	100	27	100	7	0.8	13.4	93	625	8	58.5	3	6.2	1.5	1.78	—
	Minimum	0.2	0.68	0.03	80	8	0	0	0	10.8	83	429	7.9	21	2	1.5	1.4	1.78	—
	Maximum	0.2	3	0.28	100	33	100	22	5.9	14.8	111	761	8.2	70	57	61.6	8.1	9.8	—
	Std. dev.	0	0.76	0.07	7.79	10.1	36.7	8.7	2.17	1.23	9.38	83.2	0.09	22.5	15	33.4	3.84	4.63	—
	N obs.	15	15	15	7	7	7	7	15	15	15	14	14	4	14	3	3	3	0
M790.3F	Mean	0.2	1.3	0.15	95	20	95	12	2.32	13.8	100	611	8.1	34	8	—	—	—	—
	Median	0.2	0.96	0.12	100	25	100	10	2	14.3	101	613	8	35.5	3	—	—	—	—
	Minimum	0.2	0.7	0.08	80	1	80	2	0	10.6	85	422	7.9	3	2	—	—	—	—
	Maximum	0.2	3.55	0.33	100	28	100	25	5.8	15.8	118	765	8.3	62	41	—	—	—	—
	Std. dev.	0	0.84	0.08	10	12.5	10	9.9	1.89	1.59	11.5	81.6	0.11	26.9	11	—	—	—	—
	N obs.	15	15	14	4	4	4	4	15	15	15	14	15	4	15	0	0	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1993 Near-surface measurements:																			
M792.5N	Mean	0.2	2.11	0.21	100	24	100	15	2.31	13.1	95	605	8	89	8	—	—	—	—
	Median	0.2	1.75	0.09	100	24	100	15	1.95	13.4	96	612	8	80.5	3	—	—	—	—
	Minimum	0.2	1.48	0.06	100	22	100	6	0	10.8	85	430	7.9	20	2	—	—	—	—
	Maximum	0.2	4.3	0.73	100	26	100	24	5.2	14.4	105	733	8.2	185	39	—	—	—	—
	Std. dev.	0	0.9	0.24	0	2.83	0	13	1.54	0.96	5.93	77	0.08	62.7	11.7	—	—	—	—
	N obs.	14	14	13	2	2	2	2	14	14	14	13	14	6	14	0	0	0	0
M793.9P	Mean	0.2	2.06	0.33	10	3	10	1	2.58	12.7	93	607	8	28.7	12	24.9	3.4	2.73	—
	Median	0.2	1.81	0.2	10	3	10	1	2.05	13.1	94	623	8	21	3	2.7	1.7	1.17	—
	Minimum	0.2	1.4	0.11	10	3	10	1	1	10.2	82	429	7.9	19	2	1.8	-0.1	-1	—
	Maximum	0.2	4	1.01	10	3	10	1	6	13.9	103	675	8.2	46	56	70.1	8.5	8.02	—
	Std. dev.	0	0.82	0.31	—	—	—	—	1.52	1.09	6.53	71.7	0.08	15	18.4	39.2	4.54	4.71	—
	N obs.	14	14	14	1	1	1	1	14	14	14	13	14	3	14	3	3	3	0
M796.7M	Mean	0.2	1.38	0.13	7	6	7	4	3.13	13.1	97	604	8	43	10	—	—	—	—
	Median	0.2	0.93	0.03	7	6	7	4	2.9	13.4	99	623	8	50	4	—	—	—	—
	Minimum	0.2	0.47	0	4	4	4	2	1.9	10.7	82	435	7.9	21	2	—	—	—	—
	Maximum	0.2	4.7	0.65	10	8	10	5	6	14.6	108	660	8.2	58	69	—	—	—	—
	Std. dev.	0	1.19	0.23	4.24	2.83	4.24	2.1	1.31	1.18	7.73	60.9	0.08	19.5	18.3	—	—	—	—
	N obs.	14	14	13	2	2	2	2	14	14	14	13	14	3	14	0	0	0	0
M796.9M	Mean	0.2	7.99	—	—	—	—	—	15.1	9.37	89	592	8.3	55.6	29	44.3	12	18	—
	Median	0.2	8.2	—	—	—	—	—	16.5	8.8	94	588	8.4	37	31	57.2	10.9	18.7	—
	Minimum	0.2	3.4	—	—	—	—	—	1	5.5	63	506	7.9	26	6	3.9	2.5	4.28	—
	Maximum	0.2	10.4	—	—	—	—	—	26	14.2	111	680	8.7	152	48	67.9	33.4	41.9	—
	Std. dev.	0	1.73	—	—	—	—	—	7.95	2.79	12.7	46.5	0.22	40.1	15.9	23	7.31	10.1	—
	N obs.	18	18	0	0	0	0	0	18	18	18	18	18	17	18	16	16	16	0
M796.9N	Mean	0.2	4.13	0.24	—	—	—	—	9.09	10.9	90	572	8.1	108	20	43.8	9.8	16.2	—
	Median	0.2	3.4	0.19	—	—	—	—	4.05	11.9	91	580	8.1	52	17	51.4	9.7	17.6	—
	Minimum	0.2	2.4	0.06	—	—	—	—	0.9	5.9	67	420	7.8	20	2	4.4	2.2	5.35	—
	Maximum	0.2	7.9	0.65	—	—	—	—	25.2	14.3	103	690	8.7	280	63	79.9	15.5	39.3	—
	Std. dev.	0	1.52	0.18	—	—	—	—	8.58	2.6	7.97	77.7	0.25	89	18.4	24.3	4.31	9.21	—
	N obs.	32	32	14	0	0	0	0	32	32	32	31	32	30	32	16	16	16	0
VM00.1M	Mean	0.2	3.96	0.19	100	11	73	4	8.51	10.5	85	597	8.1	91.8	16	26.8	8	—	—
	Median	0.2	3.55	0.07	100	9	100	3	4.05	10.6	82	604	8.1	67	11	25.7	8	—	—
	Minimum	0.2	2.53	0.02	100	1	0	0	0	4.8	57	431	7.8	26	2	3.2	2.2	—	—
	Maximum	0.2	6.5	0.9	100	21	100	15	24.4	17.2	127	690	8.7	280	38	46.8	12.9	—	—
	Std. dev.	0	1.21	0.28	0	6.58	42.7	4.6	8.86	3.59	19.6	56.7	0.24	68.8	12.8	13.1	3.24	—	—
	N obs.	32	32	14	9	9	9	9	32	32	32	31	32	27	32	16	16	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1993 Near-surface measurements:																			
WW01.3M	Mean	0.2	—	—	100	20	0	0	11.1	9.89	89	574	8.2	—	42	68.2	9.8	—	—
	Median	0.2	—	—	100	20	0	0	13	9.65	90	571	8.2	—	18	37.7	4.8	—	—
	Minimum	0.2	—	—	100	20	0	0	0.1	7.1	73	420	8	—	4	7.7	2	—	—
	Maximum	0.2	—	—	100	20	0	0	17.9	12.3	95	671	8.4	—	380	411	59.1	—	—
	Std. dev.	0	—	—	—	—	—	—	5.32	1.58	6.25	53	0.1	—	86.2	99.2	13.9	—	—
	N obs.	18	0	0	1	1	1	1	18	18	18	18	18	0	18	16	16	0	0
ZM00.1M	Mean	0.2	1.59	—	—	—	—	—	13.5	9.98	94	573	8.3	53.9	62	113	17.9	—	—
	Median	0.2	1.4	—	—	—	—	—	16	9.7	96	573	8.4	38	23	48.8	8.4	—	—
	Minimum	0.2	0.8	—	—	—	—	—	2	7.2	78	438	8	9	6	7.7	2.1	—	—
	Maximum	0.2	2.5	—	—	—	—	—	21.8	13.2	101	700	8.5	152	470	757	87	—	—
	Std. dev.	0	0.55	—	—	—	—	—	6.35	1.91	6.36	69.7	0.15	40.2	111	187	23.3	—	—
	N obs.	17	17	0	0	0	0	0	17	17	17	17	17	15	17	15	15	0	0
1993 Middepth measurements:																			
M757.4O	Mean	0.83	1.44	0	—	—	—	—	0.71	9.62	67	624	7.7	—	5	—	—	—	—
	Median	0.8	1.4	0	—	—	—	—	0.65	10.3	70	624	7.7	—	5	—	—	—	—
	Minimum	0.6	1.18	0	—	—	—	—	0	5.2	37	577	7.7	—	3	—	—	—	—
	Maximum	1.2	1.72	0	—	—	—	—	1.9	13	91	670	7.7	—	7	—	—	—	—
	Std. dev.	0.17	0.16	—	—	—	—	—	0.62	2.71	18.4	65.8	0.01	—	2.83	—	—	—	—
	N obs.	12	12	1	—	—	—	—	12	12	12	2	2	—	2	0	0	0	0
M758.6Y	Mean	1.07	1.59	0.02	—	—	—	—	0.14	12.1	83	506	7.8	—	5	—	—	—	—
	Median	1.1	1.62	0.02	—	—	—	—	0	12	82	506	7.8	—	5	—	—	—	—
	Minimum	0.9	1.24	0.02	—	—	—	—	0	10.8	74	452	7.7	—	3	—	—	—	—
	Maximum	1.2	1.74	0.02	—	—	—	—	1.2	13.7	94	560	7.9	—	6	—	—	—	—
	Std. dev.	0.09	0.13	—	—	—	—	—	0.38	0.98	6.85	76.4	0.09	—	2.12	—	—	—	—
	N obs.	10	10	1	—	—	—	—	10	10	10	2	2	—	2	0	0	0	0
M766.0B	Mean	5.55	11.6	—	—	—	—	—	1.53	12.6	90	—	—	—	—	—	—	—	—
	Median	5.5	11.4	—	—	—	—	—	1	12.5	89	—	—	—	—	—	—	—	—
	Minimum	5.2	11	—	—	—	—	—	0.1	10.1	76	—	—	—	—	—	—	—	—
	Maximum	6.8	13.7	—	—	—	—	—	5.9	16.6	115	—	—	—	—	—	—	—	—
	Std. dev.	0.41	0.69	—	—	—	—	—	1.56	1.75	10.5	—	—	—	—	—	—	—	—
	N obs.	12	12	0	—	—	—	—	12	12	12	0	0	—	0	0	0	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1993 Middepth measurements:																			
M766.0I	Mean	2.98	6.32	—	—	—	—	—	6.46	11.8	93	—	—	—	—	—	—	—	—
	Median	2.5	5.46	—	—	—	—	—	0.7	12.2	92	—	—	—	—	—	—	—	—
	Minimum	2.3	5.26	—	—	—	—	—	0	7.2	78	—	—	—	—	—	—	—	—
	Maximum	4.1	8.3	—	—	—	—	—	20	17	116	—	—	—	—	—	—	—	—
	Std. dev.	0.71	1.19	—	—	—	—	—	8.08	2.91	11.6	—	—	—	—	—	—	—	—
	N obs.	19	19	0	—	—	—	—	19	19	19	0	0	—	0	0	0	0	0
M766.0O	Mean	1.3	1.95	—	—	—	—	—	1.3	13	92	694	8.1	—	2	—	—	—	—
	Median	1.3	1.96	—	—	—	—	—	1.15	13.2	91	694	8.1	—	2	—	—	—	—
	Minimum	1.2	1.91	—	—	—	—	—	0.1	10.2	76	694	8.1	—	2	—	—	—	—
	Maximum	1.4	1.97	—	—	—	—	—	2.9	15.9	115	694	8.1	—	2	—	—	—	—
	Std. dev.	0.07	0.02	—	—	—	—	—	0.79	1.81	12.8	—	—	—	—	—	—	—	—
	N obs.	10	10	0	—	—	—	—	10	10	10	1	1	—	1	0	0	0	0
M771.2P	Mean	4.67	9.56	—	—	—	—	—	16.5	8.77	90	—	—	—	—	—	—	—	—
	Median	4.7	9.6	—	—	—	—	—	16.7	8.2	86	—	—	—	—	—	—	—	—
	Minimum	4.3	9.4	—	—	—	—	—	11.2	7.1	75	—	—	—	—	—	—	—	—
	Maximum	4.8	9.7	—	—	—	—	—	20.2	11.1	114	—	—	—	—	—	—	—	—
	Std. dev.	0.17	0.13	—	—	—	—	—	2.77	1.56	13.3	—	—	—	—	—	—	—	—
	N obs.	7	7	0	—	—	—	—	7	7	7	0	0	—	0	0	0	0	0
M775.6Q	Mean	4.39	9.12	—	—	—	—	—	6.56	11.4	90	—	—	—	—	—	—	—	—
	Median	4	8.57	—	—	—	—	—	1.6	11.8	88	—	—	—	—	—	—	—	—
	Minimum	3.7	8.16	—	—	—	—	—	0	7.4	78	—	—	—	—	—	—	—	—
	Maximum	5.4	10.7	—	—	—	—	—	20.2	17.3	118	—	—	—	—	—	—	—	—
	Std. dev.	0.61	0.96	—	—	—	—	—	7.42	2.49	10.2	—	—	—	—	—	—	—	—
	N obs.	21	21	0	—	—	—	—	21	21	21	0	0	—	0	0	0	0	0
M781.2E	Mean	3.58	7.41	—	—	—	—	—	1.72	12.8	92	—	—	—	—	—	—	—	—
	Median	3.4	7.1	—	—	—	—	—	1.25	13.1	91	—	—	—	—	—	—	—	—
	Minimum	2.9	6.47	—	—	—	—	—	0	9.9	78	—	—	—	—	—	—	—	—
	Maximum	4.8	9.5	—	—	—	—	—	5.9	14.9	103	—	—	—	—	—	—	—	—
	Std. dev.	0.57	0.98	—	—	—	—	—	1.94	1.55	7.9	—	—	—	—	—	—	—	—
	N obs.	12	12	0	—	—	—	—	12	12	12	0	0	—	0	0	0	0	0
M781.2O	Mean	2.75	5.84	—	—	—	—	—	6.2	12	94	—	—	—	—	—	—	—	—
	Median	2.3	5.06	—	—	—	—	—	1.1	12.1	94	—	—	—	—	—	—	—	—
	Minimum	2.1	4.95	—	—	—	—	—	0	7.5	79	—	—	—	—	—	—	—	—
	Maximum	3.7	7.5	—	—	—	—	—	20.1	16.6	113	—	—	—	—	—	—	—	—
	Std. dev.	0.65	1.01	—	—	—	—	—	7.63	2.8	10.1	—	—	—	—	—	—	—	—
	N obs.	21	21	0	—	—	—	—	21	21	21	0	0	—	0	0	0	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1993 Middepth measurements:																			
M781.2X	Mean	1.16	1.81	—	—	—	—	—	0.56	13.9	96	649	8	—	3	—	—	—	—
	Median	1.15	1.81	—	—	—	—	—	0.3	14.4	100	649	8	—	3	—	—	—	—
	Minimum	1	1.74	—	—	—	—	—	0	11.9	81	640	7.9	—	2	—	—	—	—
	Maximum	1.4	1.88	—	—	—	—	—	2	15.5	109	658	8.1	—	3	—	—	—	—
	Std. dev.	0.12	0.05	—	—	—	—	—	0.61	1.36	9.57	12.7	0.19	—	0.71	—	—	—	—
	N obs.	12	12	0	—	—	—	—	12	12	12	2	2	—	2	0	0	0	0
M786.1S	Mean	0.4	0.92	—	—	—	—	—	0.54	14.6	101	687	—	—	—	—	—	—	—
	Median	0.4	0.91	—	—	—	—	—	0.2	14.7	103	687	—	—	—	—	—	—	—
	Minimum	0.3	0.82	—	—	—	—	—	0	13	89	687	—	—	—	—	—	—	—
	Maximum	0.5	0.97	—	—	—	—	—	2.1	15.9	115	687	—	—	—	—	—	—	—
	Std. dev.	0.08	0.05	—	—	—	—	—	0.78	0.98	8.31	—	—	—	—	—	—	—	—
	N obs.	7	7	0	—	—	—	—	7	7	7	1	0	—	0	0	0	0	0
1993 Near-bottom measurements:																			
M753.1X	Mean	1.65	1.85	—	—	—	—	—	13.5	9.74	89	—	—	—	—	—	—	—	—
	Median	1.65	1.85	—	—	—	—	—	15	9.45	92	—	—	—	—	—	—	—	—
	Minimum	1.3	1.5	—	—	—	—	—	0.1	6.1	72	—	—	—	—	—	—	—	—
	Maximum	2.1	2.3	—	—	—	—	—	25	15.1	104	—	—	—	—	—	—	—	—
	Std. dev.	0.23	0.23	—	—	—	—	—	8.88	2.82	8.98	—	—	—	—	—	—	—	—
	N obs.	14	14	0	—	—	—	—	14	14	14	0	0	—	0	0	0	0	0
M753.2S	Mean	2.86	3.35	0	—	—	—	—	0.97	12.7	89	602	7.9	—	2	—	—	—	—
	Median	2.7	3.27	0	—	—	—	—	0.05	12.6	87	602	7.9	—	2	—	—	—	—
	Minimum	2.5	3.16	0	—	—	—	—	0	10.8	79	503	7.9	—	2	—	—	—	—
	Maximum	3.6	3.8	0	—	—	—	—	5	14.6	108	700	8	—	2	—	—	—	—
	Std. dev.	0.37	0.21	—	—	—	—	—	1.6	1.24	8.63	139	0.11	—	0	—	—	—	—
	N obs.	14	14	1	—	—	—	—	14	14	14	2	2	—	2	0	0	0	0
M757.2Z	Mean	3.59	3.79	—	—	—	—	—	12.6	9.69	87	—	—	—	—	—	—	—	—
	Median	3.6	3.8	—	—	—	—	—	13.5	8.55	83	—	—	—	—	—	—	—	—
	Minimum	3.2	3.4	—	—	—	—	—	0.2	5.4	63	—	—	—	—	—	—	—	—
	Maximum	4.2	4.4	—	—	—	—	—	24.1	15.3	120	—	—	—	—	—	—	—	—
	Std. dev.	0.28	0.28	—	—	—	—	—	8.67	3.24	14.3	—	—	—	—	—	—	—	—
	N obs.	14	14	0	—	—	—	—	14	14	14	0	0	—	0	0	0	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
									1993 Near-bottom measurements:										
M764.3A	Mean	6.86	7.06	—	—	—	—	—	14.5	8.92	84	566	8.3	—	13	11.4	4.4	—	—
	Median	6.8	7	—	—	—	—	—	16.7	8.45	83	561	8.3	—	12	11.1	4.4	—	—
	Minimum	4.6	4.8	—	—	—	—	—	0.2	4.5	54	479	7.9	—	5	2.2	1.2	—	—
	Maximum	8.6	8.8	—	—	—	—	—	24.4	13.7	134	666	8.8	—	27	23.1	8.1	—	—
	Std. dev.	1.1	1.1	—	—	—	—	—	8	2.89	17.4	53.3	0.25	—	6.39	5.58	1.81	—	—
	N obs.	18	18	0	—	—	—	—	18	18	18	18	18	—	17	14	14	0	0
M766.0B	Mean	11.1	11.6	—	—	—	—	—	2.12	10.8	78	750	8	—	2	—	—	—	—
	Median	10.9	11.4	—	—	—	—	—	1.9	11.2	83	750	8	—	2	—	—	—	—
	Minimum	10.5	11	—	—	—	—	—	1	7.2	52	750	8	—	2	—	—	—	—
	Maximum	13.5	13.7	—	—	—	—	—	5.9	12.8	92	750	8	—	2	—	—	—	—
	Std. dev.	0.79	0.69	—	—	—	—	—	1.31	1.71	12.2	—	—	—	—	—	—	—	—
	N obs.	12	12	0	—	—	—	—	12	12	12	1	1	—	1	0	0	0	0
M766.0I	Mean	6.49	6.82	—	—	—	—	—	11.7	9.51	83	594	8.1	—	13	16.9	6.3	16.3	—
	Median	6.8	7	—	—	—	—	—	14.5	9.7	81	580	8.1	—	11	16.2	6.1	16.3	—
	Minimum	4.6	5.26	—	—	—	—	—	0	4.4	53	461	7.9	—	1	2.3	2.6	16.3	—
	Maximum	8.9	9.1	—	—	—	—	—	24.1	16.4	130	783	8.6	—	35	31.6	9.6	16.3	—
	Std. dev.	1.36	1.18	—	—	—	—	—	9.18	3.22	15.4	82.3	0.21	—	10.3	8.23	1.81	—	—
	N obs.	36	36	0	—	—	—	—	36	36	36	36	35	—	36	14	13	1	0
M771.2P	Mean	9.2	9.4	—	—	—	—	—	16.2	7.92	77	558	8.2	—	28	26.1	7.9	—	—
	Median	9.2	9.4	—	—	—	—	—	17.6	7.5	80	558	8.2	—	25	22.9	7.1	—	—
	Minimum	7.9	8.1	—	—	—	—	—	0.5	0.8	9	426	7.6	—	5	1.8	2.7	—	—
	Maximum	11.1	11.3	—	—	—	—	—	24	14.3	100	709	8.6	—	67	75.3	16.9	—	—
	Std. dev.	0.87	0.87	—	—	—	—	—	7.19	2.89	18	60.8	0.24	—	16.2	19.4	3.74	—	—
	N obs.	26	26	0	—	—	—	—	26	26	26	26	25	—	26	16	15	0	0
M775.6L	Mean	2.97	3.51	—	—	—	—	—	1.62	12.4	89	597	8	—	2	—	—	—	—
	Median	2.4	2.96	—	—	—	—	—	1	12.8	90	597	8	—	2	—	—	—	—
	Minimum	2.1	2.77	—	—	—	—	—	0	10.1	70	597	8	—	2	—	—	—	—
	Maximum	6.1	6.3	—	—	—	—	—	6	14.9	102	597	8	—	2	—	—	—	—
	Std. dev.	1.29	1.14	—	—	—	—	—	1.82	1.49	8.46	—	—	—	—	—	—	—	—
	N obs.	13	13	0	—	—	—	—	13	13	13	1	1	—	1	0	0	0	0
M775.6Q	Mean	9.04	9.37	—	—	—	—	—	11.3	9.53	83	586	8.1	—	21	27.9	8.3	—	—
	Median	8.9	9.28	—	—	—	—	—	11.1	9.95	81	577	8.1	—	23	29.6	8.8	—	—
	Minimum	7.5	8.16	—	—	—	—	—	0.5	5.3	60	440	7.6	—	3	4.4	2.6	—	—
	Maximum	11.3	11.5	—	—	—	—	—	24.6	15.6	109	825	8.7	—	43	45.8	12.1	—	—
	Std. dev.	1.15	1.01	—	—	—	—	—	9.05	2.8	12.4	83	0.24	—	15.1	12.5	2.63	—	—
	N obs.	40	40	0	—	—	—	—	40	40	40	40	39	—	40	16	16	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1993 Near-bottom measurements:																			
M775.6Y	Mean	4.09	4.64	—	—	—	—	—	2.06	11.8	85	657	8	—	3	—	—	—	—
	Median	4.05	4.67	—	—	—	—	—	1.95	11.1	81	657	8	—	3	—	—	—	—
	Minimum	2.4	2.96	—	—	—	—	—	0.1	9	65	638	7.9	—	3	—	—	—	—
	Maximum	6.3	6.5	—	—	—	—	—	5.9	21	148	675	8.1	—	3	—	—	—	—
	Std. dev.	0.88	0.76	—	—	—	—	—	1.69	3.01	20.2	26.2	0.16	—	0	—	—	—	—
	N obs.	14	14	0	—	—	—	—	14	14	14	2	2	—	2	0	0	0	0
M781.2E	Mean	6.99	7.41	—	—	—	—	—	1.88	12.7	91	656	8.1	—	3	—	—	—	—
	Median	6.65	7.1	—	—	—	—	—	1.6	12.9	90	656	8.1	—	3	—	—	—	—
	Minimum	5.9	6.47	—	—	—	—	—	0	9.9	78	639	8	—	3	—	—	—	—
	Maximum	9.3	9.5	—	—	—	—	—	5.9	14.8	104	673	8.1	—	3	—	—	—	—
	Std. dev.	1.08	0.98	—	—	—	—	—	1.89	1.52	7.96	24	0.1	—	0	—	—	—	—
	N obs.	12	12	0	—	—	—	—	12	12	12	2	2	—	2	0	0	0	0
M781.2O	Mean	5.82	6.15	—	—	—	—	—	11.3	9.43	82	581	8.1	—	25	39.6	10.1	—	—
	Median	5.9	6.1	—	—	—	—	—	11.3	9.15	82	581	8.1	—	28	40.4	9.9	—	—
	Minimum	4.2	4.95	—	—	—	—	—	0.1	4.5	46	418	7.8	—	3	4.5	3	—	—
	Maximum	8.1	8.3	—	—	—	—	—	24.8	14.6	107	771	8.7	—	55	74.2	17.6	—	—
	Std. dev.	1.2	1.04	—	—	—	—	—	8.96	3.04	14.1	82.9	0.22	—	17.7	19.5	3.82	—	—
	N obs.	40	40	0	—	—	—	—	40	40	40	40	39	—	40	16	16	0	0
M787.9H	Mean	0.95	1.18	0.05	—	—	—	—	2.65	13.7	101	630	—	—	—	—	—	—	—
	Median	0.6	0.86	0.05	—	—	—	—	2.75	14.2	102	630	—	—	—	—	—	—	—
	Minimum	0.4	0.68	0.05	—	—	—	—	0.1	10.9	84	630	—	—	—	—	—	—	—
	Maximum	2.7	2.9	0.05	—	—	—	—	5.4	14.9	111	630	—	—	—	—	—	—	—
	Std. dev.	0.77	0.76	—	—	—	—	—	1.95	1.3	9.31	—	—	—	—	—	—	—	—
	N obs.	8	8	1	—	—	—	—	8	8	8	1	0	—	0	0	0	0	0
VM00.1M	Mean	2.65	2.94	0.05	—	—	—	—	0.72	12.9	90	624	8	—	4	—	—	—	—
	Median	2.5	2.81	0.05	—	—	—	—	0.2	12.4	85	624	8	—	4	—	—	—	—
	Minimum	2	2.53	0.04	—	—	—	—	0	9	62	618	7.9	—	3	—	—	—	—
	Maximum	4	4.15	0.05	—	—	—	—	3	17.3	122	630	8.1	—	4	—	—	—	—
	Std. dev.	0.5	0.44	0.01	—	—	—	—	1.09	2.59	19.6	8.49	0.08	—	0.71	—	—	—	—
	N obs.	13	13	2	—	—	—	—	13	13	13	2	2	—	2	0	0	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1994 Near-surface measurements:																			
CH00.1M	Mean	0.2	1.87	—	—	—	—	—	12.3	10.2	94	152	8	93.6	26	42.9	7.5	16.2	—
	Median	0.2	1.74	—	—	—	—	—	13.2	9.9	92	152	7.9	93	9	11.9	4.4	15.7	—
	Minimum	0.2	0.6	—	—	—	—	—	0	7.3	73	95	7.2	8	4	0.3	0.2	1.87	—
	Maximum	0.2	5	—	—	—	—	—	25.6	13.1	117	217	8.9	227	300	477	57.4	36.7	—
	Std. dev.	0	0.9	—	—	—	—	—	9.32	1.73	10.6	30.1	0.47	46.9	61.9	104	12	12.3	—
	N obs.	23	23	0	0	0	0	0	23	23	23	23	23	21	23	22	22	23	0
CN00.1M	Mean	0.2	1.78	—	95	22	95	7	11.3	10.6	93	595	8.3	55.4	29	55.6	10	—	—
	Median	0.2	1.7	—	95	22	95	7	13.2	11.2	93	573	8.2	50	20	33.3	7.7	—	—
	Minimum	0.2	0.8	—	90	9	90	4	0	7	80	427	8	11	4	5.6	1.3	—	—
	Maximum	0.2	3.3	—	100	35	100	10	23.9	14.1	122	783	9	105	220	356	53	—	—
	Std. dev.	0	0.65	—	7.07	18.4	7.07	4.2	8.89	2.46	9.61	89.4	0.24	24.1	44.2	76.7	11.1	—	—
	N obs.	24	23	0	2	2	2	2	24	24	24	24	24	19	24	23	23	0	0
M738.2F	Mean	0.2	—	—	—	—	—	—	12.6	10.5	95	490	8.3	—	14	15.8	5.6	23.7	—
	Median	0.2	—	—	—	—	—	—	14.5	10.1	94	475	8.3	—	15	15.7	5.6	21.2	—
	Minimum	0.2	—	—	—	—	—	—	0.1	6.3	73	425	7.8	—	3	1.2	1.2	-1	—
	Maximum	0.2	—	—	—	—	—	—	25.8	14.2	118	640	8.9	—	32	34	10.6	82.3	—
	Std. dev.	0	—	—	—	—	—	—	9.28	2.56	10.3	51.5	0.27	—	7.7	9.35	2.74	19.9	—
	N obs.	24	0	0	0	0	0	0	24	24	24	24	24	0	24	23	23	24	0
M742.6B	Mean	0.2	1.38	0.83	—	—	—	—	12.4	11.3	104	500	8.5	37.9	28	32.2	11.8	39.6	—
	Median	0.2	1.4	0.73	—	—	—	—	14.2	11	101	490	8.4	37	30	34.9	10.2	36	—
	Minimum	0.2	1	0.37	—	—	—	—	0.2	5.8	68	392	8	15	3	2.2	1.7	-1	—
	Maximum	0.2	2	1.7	—	—	—	—	26.3	17	146	642	9.1	70	82	75.9	62.3	110	—
	Std. dev.	0	0.28	0.35	—	—	—	—	9.27	2.73	22.6	54	0.34	12.1	19.5	21.7	12.4	32.9	—
	N obs.	24	21	21	0	0	0	0	24	24	24	24	24	18	24	23	23	24	0
M742.8D	Mean	0.2	1.92	1.01	—	—	—	—	12.4	10.9	100	495	8.4	55.7	22	25.3	7.8	32.6	—
	Median	0.2	1.9	0.96	—	—	—	—	14.2	10.6	97	482	8.4	44	24	27.2	7.6	21.3	—
	Minimum	0.2	1.6	0.47	—	—	—	—	0	6	65	393	7.9	28	3	2	1.6	-1	—
	Maximum	0.2	2.6	1.98	—	—	—	—	26	16.3	138	624	9.1	146	56	63.5	19.9	134	—
	Std. dev.	0	0.23	0.41	—	—	—	—	9.45	2.52	20.2	51.5	0.3	30.9	14.6	18.6	5.31	30.7	—
	N obs.	24	21	21	0	0	0	0	24	24	24	24	24	20	24	23	23	24	0
M745.2L	Mean	0.2	1.9	0.48	100	16	100	9	12.6	10.4	95	493	8.3	80.3	14	16.7	5.2	18.8	—
	Median	0.2	1.95	0.51	100	14	100	5	13.7	10.7	94	485	8.2	67	14	17	4.8	19.9	—
	Minimum	0.2	1.34	0.13	100	9	100	5	0	5.8	68	420	7.9	34	3	2.4	1.5	1.6	—
	Maximum	0.2	2.4	0.74	100	25	100	16	25.3	14.4	121	618	8.8	180	41	47.3	13.7	65.9	—
	Std. dev.	0	0.26	0.16	0	8.19	0	6.4	9.47	2.6	13.9	46.5	0.23	34.3	7.98	11	2.92	14.4	—
	N obs.	24	24	24	3	3	3	3	24	24	24	24	24	23	24	23	23	24	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1994 Near-surface measurements:																			
M746.9Y	Mean	0.2	3.55	—	30	10	30	1	12.8	10.2	93	419	8.2	95.3	12	12.6	4.4	16.2	—
	Median	0.2	3.4	—	30	10	30	1	13.9	10.1	94	411	8.2	71	13	12.5	4.7	13.1	—
	Minimum	0.2	0.8	—	30	10	30	1	0.2	6.2	75	307	7.9	41	3	1.4	0.6	1.87	—
	Maximum	0.2	6.2	—	30	10	30	1	25.2	14.3	115	543	8.8	260	32	37.8	8.9	54.6	—
	Std. dev.	0	0.93	—	—	—	—	—	9.4	2.5	10.8	63.7	0.24	57.1	5.92	8.04	2.31	11.8	—
	N obs.	24	24	0	1	1	1	1	24	24	24	24	24	23	24	22	22	23	0
M747.3R	Mean	0.2	1.49	0.85	100	9	100	3	12.4	10.2	92	498	8.2	71.4	15	18.9	5.1	16.3	—
	Median	0.2	1.5	0.82	100	9	100	3	13.3	10.8	94	491	8.2	70.5	15	18.3	5.4	12.7	—
	Minimum	0.2	0.9	0.23	100	9	100	3	0	5.8	68	430	7.9	27	3	2.1	-0.1	-1	—
	Maximum	0.2	2.3	1.73	100	9	100	3	25	13.9	112	619	8.7	120	52	63.8	16.8	65.9	—
	Std. dev.	0	0.27	0.33	0	0	0	—	9.4	2.55	11.9	43.6	0.2	20	9.84	14	3.52	15.2	—
	N obs.	24	23	23	2	2	2	1	24	24	24	24	24	20	24	22	22	23	0
M752.8Y	Mean	0.2	5.9	—	—	—	—	—	12.5	10.3	93	504	8.3	88.5	12	12	4.7	17.5	—
	Median	0.2	5.8	—	—	—	—	—	13.9	10.5	91	501	8.2	69	13	13.6	4.6	14.4	—
	Minimum	0.2	3.7	—	—	—	—	—	0	5.8	68	425	7.9	58	3	0.1	1.2	-1	—
	Maximum	0.2	8.8	—	—	—	—	—	24.8	14.7	125	614	8.9	253	23	24.2	8.9	63.6	—
	Std. dev.	0	1.37	—	—	—	—	—	9.33	2.74	15.3	41.3	0.24	48.5	5.53	6.08	2.3	15.1	—
	N obs.	24	22	0	0	0	0	0	24	24	24	24	24	22	24	23	23	24	0
M752.8Z	Mean	0.2	2.64	—	—	—	—	—	12.3	10.1	91	377	8.2	101	15	16.6	5.5	19.1	—
	Median	0.2	2.55	—	—	—	—	—	13.8	10.4	92	372	8.1	66	13	15.5	5.7	17	—
	Minimum	0.2	1.8	—	—	—	—	—	0	6	71	213	7.7	31	4	1.9	1.4	-1	—
	Maximum	0.2	4.1	—	—	—	—	—	25	14.2	120	544	8.8	746	43	50.1	11.4	51.5	—
	Std. dev.	0	0.62	—	—	—	—	—	9.4	2.51	12.7	87.6	0.27	150	9.17	11.1	2.92	13.7	—
	N obs.	24	22	0	0	0	0	0	24	24	24	24	24	21	24	23	23	24	0
M753.1X	Mean	0.2	1.83	0.24	100	25	96	7	12.4	10.8	99	515	8.3	85.2	10	12	4.4	18.6	—
	Median	0.2	1.88	0.22	100	27	100	6	12.8	11.1	95	509	8.3	74.5	12	13.1	4.5	18.7	—
	Minimum	0.2	1.3	0.05	100	7	80	1	0	6.3	74	423	7.9	54	2	1.5	0.9	1.07	—
	Maximum	0.2	2.1	0.5	100	42	100	14	27	13.8	165	630	9	187	17	39.6	7.4	64.9	—
	Std. dev.	0	0.2	0.13	0	12.8	8.94	4.8	9.81	2.24	21.1	47.9	0.3	33.4	4.68	8.54	2.12	15.5	—
	N obs.	24	24	22	5	5	5	5	24	24	24	24	24	22	24	23	23	24	0
M757.2Z	Mean	0.2	3.64	0.13	97.1	25	84	8	11.8	10.5	96	349	8.2	79.3	16	18.4	6	22.8	—
	Median	0.2	3.5	0.1	100	22	100	9	11.2	10.2	94	352	8.1	72	13	14.3	4.9	20.8	—
	Minimum	0.2	3	0.03	80	1	0	0	0.1	5.8	64	150	7.5	30	4	1.5	1.4	1.07	—
	Maximum	0.2	5	0.41	100	47	100	16	27.5	14.3	181	510	9	160	45	52.8	18.5	55.4	—
	Std. dev.	0	0.46	0.09	7.56	15.4	37.4	5	10.2	2.14	23.7	86.2	0.38	36.1	11.2	14.7	4.4	17.1	—
	N obs.	25	25	23	7	7	7	7	25	25	25	24	24	25	24	24	24	24	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1994 Near-surface measurements:																			
M764.3A	Mean	0.2	5.86	—	—	—	—	—	13.1	10.1	93	524	8.3	105	10	11.4	3.6	15.8	—
	Median	0.2	5.8	—	—	—	—	—	14	10.4	92	517	8.3	85.5	11	8.9	4	11.2	—
	Minimum	0.2	4.4	—	—	—	—	—	0.2	6.4	75	425	7.9	56	3	0.9	0.4	-1	—
	Maximum	0.2	7.3	—	—	—	—	—	27.1	15.2	170	661	8.9	340	14	88.6	6.1	54.3	—
	Std. dev.	0	0.83	—	—	—	—	—	9.49	2.63	19	57.3	0.26	60.3	3.49	17.2	1.54	13	—
	N obs.	23	23	0	0	0	0	0	23	23	23	23	23	22	23	23	23	23	0
M766.0I	Mean	0.2	6.41	—	100	40	83	10	15.2	9.88	95	534	8.3	102	10	9.1	4	18.7	—
	Median	0.2	6.45	—	100	43	100	11	20.8	10	93	526	8.3	87.5	10	9.5	4.1	16.7	—
	Minimum	0.2	5.5	—	100	17	0	5	0.1	6.1	68	431	7.9	60	2	0.7	1	1.6	—
	Maximum	0.2	7.7	—	100	55	100	13	27.2	16	168	746	8.8	235	20	30.8	8	54.3	—
	Std. dev.	0	0.61	—	0	14.3	40.8	3.3	9.72	2.82	22.9	64.2	0.24	45.6	4.35	6.41	2.01	15.1	—
	N obs.	32	32	0	6	6	6	5	32	32	32	32	32	32	32	24	24	24	0
M771.2P	Mean	0.2	8.42	—	100	37	83	10	15.2	9.41	90	538	8.3	86.7	13	12.1	4.4	17.8	—
	Median	0.2	8.35	—	100	39	100	10	21.1	8.95	87	532	8.2	69	14	12	4.7	14	—
	Minimum	0.2	7.8	—	100	15	0	5	0.1	5.8	68	451	7.9	48	2	1.2	1.2	1.07	—
	Maximum	0.2	9.8	—	100	50	100	13	27.6	14.6	171	687	8.8	230	25	34.6	8.3	49.9	—
	Std. dev.	0	0.49	—	0	13.3	40.8	3.1	9.8	2.82	19.2	59.6	0.21	46.1	5.79	8.06	2.11	13.4	—
	N obs.	32	32	0	6	6	6	5	32	32	32	32	32	31	32	24	24	24	0
M775.6Q	Mean	0.2	8.68	—	100	34	83	9	15.3	9.68	93	534	8.3	69	20	16.1	5.9	23.5	—
	Median	0.2	8.6	—	100	38	100	10	20.4	9	88	526	8.2	53	20	16.3	6	19.4	—
	Minimum	0.2	8.1	—	100	12	0	5	0.1	5.9	69	420	7.9	22	3	1.4	1.5	-1	—
	Maximum	0.2	10.1	—	100	50	100	13	27.2	14.4	143	679	8.8	220	39	30	12.1	94.2	—
	Std. dev.	0	0.47	—	0	15.6	40.8	3.5	9.83	2.63	16.8	59.7	0.24	44.7	9.83	9.31	3.08	22.7	—
	N obs.	32	32	0	6	6	6	5	32	32	32	32	32	32	31	24	24	24	0
M781.2O	Mean	0.2	5.67	—	100	40	82	10	15.4	9.93	96	530	8.3	62.6	23	21.5	8	22.1	—
	Median	0.2	5.6	—	100	41	100	10	21.1	9.75	93	520	8.3	45	24	18.9	7.4	21	—
	Minimum	0.2	4.9	—	100	13	0	5	0.1	6.5	75	455	7.9	22	2	1.9	1.2	-1	—
	Maximum	0.2	7	—	100	55	100	17	29.8	15	128	705	8.8	219	50	48.5	29.6	53	—
	Std. dev.	0	0.52	—	0	15.3	40.2	4.8	10	2.51	15.6	54.9	0.22	45.6	13.2	14.9	6.16	15.9	—
	N obs.	32	32	0	6	6	6	5	32	32	32	32	32	32	31	22	22	23	0
M786.2C	Mean	0.2	5.48	—	—	—	—	—	12.6	10.2	92	535	8.2	76.5	30	40.6	9.2	24.4	—
	Median	0.2	5.2	—	—	—	—	—	12.9	10.4	91	521	8.2	42	32	42.7	10	24.8	—
	Minimum	0.2	4.3	—	—	—	—	—	0.8	6.6	80	428	7.9	26	3	1.5	1.3	1.07	—
	Maximum	0.2	6.8	—	—	—	—	—	25.3	14.3	110	660	8.8	255	68	80.9	17.5	56.9	—
	Std. dev.	0	0.68	—	—	—	—	—	9.41	2.5	7.62	55.4	0.21	72.9	18.9	26.9	5.45	17.2	—
	N obs.	24	24	0	0	0	0	0	24	24	24	24	24	24	24	24	24	24	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1994 Near-surface measurements:																			
M786.5D	Mean	0.2	2.72	—	—	—	—	—	13.6	10.2	94	510	8.3	52.8	32	43.1	9.9	27.5	—
	Median	0.2	2.7	—	—	—	—	—	14	9.7	92	502	8.2	40	35	43	10.4	29.9	—
	Minimum	0.2	1.9	—	—	—	—	—	0.6	6.9	81	431	7.9	22	3	1.4	1.8	1.07	—
	Maximum	0.2	4	—	—	—	—	—	25.7	14.6	111	630	8.7	176	71	86.3	17.4	48.7	—
	Std. dev.	0	0.51	—	—	—	—	—	9.17	2.48	8.25	52.4	0.19	38.2	18.6	25.1	4.96	14.9	—
	N obs.	22	22	0	0	0	0	0	22	22	22	22	22	21	22	22	22	22	0
M796.9M	Mean	0.2	8.53	—	—	—	—	—	13.1	10.2	93	545	8.2	72.1	32	44.1	10.1	24.1	—
	Median	0.2	7.6	—	—	—	—	—	13.2	10.8	91	537	8.2	34.5	37	53.6	11.3	22.4	—
	Minimum	0.2	6.1	—	—	—	—	—	1.1	6.5	81	458	7.9	21	3	1.1	1.5	-1	—
	Maximum	0.2	15.8	—	—	—	—	—	25.8	14	112	670	8.8	268	75	92.7	20.9	52.4	—
	Std. dev.	0	2.53	—	—	—	—	—	9.4	2.45	8.6	56.4	0.23	75.1	20.9	28.7	5.84	17.7	—
	N obs.	24	24	0	0	0	0	0	24	24	24	24	24	24	24	24	24	24	0
M796.9N	Mean	0.2	4.5	—	—	—	—	—	12.4	10.3	92	511	8.2	60.8	30	41.8	11.3	23.3	—
	Median	0.2	4	—	—	—	—	—	12.2	10.5	92	502	8.2	38	35	53	10.8	25.3	—
	Minimum	0.2	1.9	—	—	—	—	—	0.9	6.8	83	382	7.9	21	3	2	1.4	1.07	—
	Maximum	0.2	8.4	—	—	—	—	—	25.1	13.9	113	668	8.7	267	76	88.9	48.6	51.1	—
	Std. dev.	0	1.58	—	—	—	—	—	9.39	2.43	7.7	69.1	0.21	58.8	20.2	28.1	9.88	14.9	—
	N obs.	24	24	0	0	0	0	0	24	24	24	24	24	22	24	24	24	24	0
VM00.1M	Mean	0.2	3.59	—	100	12	100	4	12.1	9.37	84	581	8.2	65.8	26	30.8	8.4	—	—
	Median	0.2	3.5	—	100	11	100	3	13.6	8.55	84	575	8.2	47	21	39.7	9.8	—	—
	Minimum	0.2	2.7	—	100	5	100	1	0.2	4.8	56	451	7.7	19	4	1.8	1.5	—	—
	Maximum	0.2	5.2	—	100	20	100	9	25.3	16.1	135	711	9	180	74	65.1	20.7	—	—
	Std. dev.	0	0.64	—	0	5.41	0	3.2	9.51	2.72	18.5	56.7	0.3	51.2	17.6	20.3	5.3	—	—
	N obs.	24	24	0	5	5	5	5	24	24	24	24	24	24	24	23	23	0	0
WW01.3M	Mean	0.2	—	—	100	32	100	7	10.5	10.5	92	559	8.2	—	38	32.7	5.6	—	—
	Median	0.2	—	—	100	34	100	5	10.9	10.3	93	561	8.3	—	10	15	3.1	—	—
	Minimum	0.2	—	—	100	26	100	5	0	7.8	82	375	7.9	—	4	5.9	0.1	—	—
	Maximum	0.2	—	—	100	36	100	12	21.2	13.1	102	636	8.4	—	520	262	44.4	—	—
	Std. dev.	0	—	—	0	5.29	0	4	6.86	1.77	4.9	51.6	0.13	—	106	53.8	8.99	—	—
	N obs.	24	0	0	3	3	3	3	24	24	24	24	24	0	24	23	23	0	0
ZM00.1M	Mean	0.2	1.45	—	90	18	90	4	13.3	10.4	97	565	8.3	57.1	46	74.9	12.6	—	—
	Median	0.2	1.36	—	90	18	90	4	15.6	10.2	97	570	8.3	59	15	28.4	5.2	—	—
	Minimum	0.2	0.8	—	90	18	90	4	0	6.9	83	354	8.1	5	4	8.8	1.7	—	—
	Maximum	0.2	2.3	—	90	18	90	4	25.8	13.5	121	716	8.5	99	480	630	113	—	—
	Std. dev.	0	0.44	—	—	—	—	—	8.4	1.83	9.78	67.2	0.14	28.1	99.3	134	23.7	—	—
	N obs.	22	22	0	1	1	1	1	22	22	22	22	22	19	22	21	21	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1994 Near-bottom measurements:																			
M753.1X	Mean	1.63	1.84	—	—	—	—	—	12	10.7	97	494	8.2	—	—	—	—	—	—
	Median	1.7	1.9	—	—	—	—	—	12	10.9	94	497	8.2	—	—	—	—	—	—
	Minimum	1.1	1.3	—	—	—	—	—	0	6.3	74	464	8	—	—	—	—	—	—
	Maximum	1.9	2.1	—	—	—	—	—	26.6	13.7	160	514	8.4	—	—	—	—	—	—
	Std. dev.	0.2	0.2	—	—	—	—	—	9.76	2.26	19.3	16.6	0.12	—	—	—	—	—	—
	N obs.	23	23	0	—	—	—	—	23	23	23	7	7	—	0	0	0	0	0
M757.2Z	Mean	3.46	3.66	—	—	—	—	—	12.1	9.75	88	314	8	—	—	—	—	—	—
	Median	3.3	3.5	—	—	—	—	—	13	9.9	90	313	8	—	—	—	—	—	—
	Minimum	2.8	3	—	—	—	—	—	0	5.8	66	147	7.2	—	—	—	—	—	—
	Maximum	4.8	5	—	—	—	—	—	25	13.8	104	428	8.3	—	—	—	—	—	—
	Std. dev.	0.48	0.48	—	—	—	—	—	9.31	2.19	11.1	90.3	0.37	—	—	—	—	—	—
	N obs.	23	23	0	—	—	—	—	23	23	23	7	7	—	0	0	0	0	0
M764.3A	Mean	5.66	5.86	—	—	—	—	—	13	9.44	85	525	8.2	—	11	9.6	3.9	—	—
	Median	5.6	5.8	—	—	—	—	—	13.7	10.3	85	517	8.2	—	11	10.6	4.4	—	—
	Minimum	4.2	4.4	—	—	—	—	—	0.5	5	56	424	7.9	—	3	1.6	1.3	—	—
	Maximum	7.1	7.3	—	—	—	—	—	25.2	14.8	104	663	8.8	—	18	16.7	7.8	—	—
	Std. dev.	0.83	0.83	—	—	—	—	—	9.15	2.84	11.9	57.4	0.23	—	4.06	4.36	1.61	—	—
	N obs.	23	23	0	—	—	—	—	23	23	23	23	23	—	23	22	22	0	0
M766.0I	Mean	6.21	6.41	—	—	—	—	—	14.8	8.61	81	535	8.2	—	15	15	4.9	—	—
	Median	6.25	6.45	—	—	—	—	—	20	7.15	81	524	8.2	—	16	14.8	5.3	—	—
	Minimum	5.3	5.5	—	—	—	—	—	0.5	4.5	51	428	7.9	—	2	0.8	-0.1	—	—
	Maximum	7.5	7.7	—	—	—	—	—	25.1	13.7	102	685	8.8	—	33	37.3	9.3	—	—
	Std. dev.	0.61	0.61	—	—	—	—	—	8.99	2.88	12.4	58.1	0.19	—	7.48	10.6	2.68	—	—
	N obs.	32	32	0	—	—	—	—	32	32	32	32	32	—	32	23	23	0	0
M771.2P	Mean	8.23	8.42	—	—	—	—	—	14.7	7.89	73	539	8.2	—	21	19.2	5.9	—	—
	Median	8.15	8.35	—	—	—	—	—	19.3	6.55	73	537	8.1	—	20	18.1	5.4	—	—
	Minimum	7.6	7.8	—	—	—	—	—	0.8	0.2	2	451	7.8	—	3	2	1.3	—	—
	Maximum	9.6	9.8	—	—	—	—	—	24.2	13.5	105	699	8.7	—	49	54.8	14.5	—	—
	Std. dev.	0.48	0.49	—	—	—	—	—	8.95	3.55	22.3	57.8	0.19	—	11.8	14.6	3.48	—	—
	N obs.	32	32	0	—	—	—	—	32	32	32	32	32	—	32	23	23	0	0
M775.6Q	Mean	8.48	8.68	—	—	—	—	—	14.8	8.25	76	535	8.2	—	32	33	8.9	—	—
	Median	8.4	8.6	—	—	—	—	—	19	6.55	76	529	8.1	—	34	24.2	7.8	—	—
	Minimum	7.9	8.1	—	—	—	—	—	0.8	0.5	6	420	7.9	—	3	2.3	0.4	—	—
	Maximum	9.9	10.1	—	—	—	—	—	24.9	14.1	111	670	8.8	—	110	152	30	—	—
	Std. dev.	0.47	0.47	—	—	—	—	—	9.11	3.49	20.8	56.8	0.2	—	22.5	34.2	7.55	—	—
	N obs.	32	32	0	—	—	—	—	32	32	32	32	32	—	32	23	23	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1994 Near-bottom measurements:																			
M781.2O	Mean	5.47	5.67	—	—	—	—	—	14.9	8.32	77	533	8.2	—	36	37.9	9.1	56.9	—
	Median	5.4	5.6	—	—	—	—	—	20.4	7.15	81	527	8.2	—	37	39.3	9.9	56.9	—
	Minimum	4.7	4.9	—	—	—	—	—	0.2	2.6	29	457	7.8	—	4	2.7	0.9	56.9	—
	Maximum	6.8	7	—	—	—	—	—	25.1	14	109	714	8.6	—	76	91.6	26.8	56.9	—
	Std. dev.	0.52	0.52	—	—	—	—	—	9.16	3.3	17.6	50	0.18	—	19	26	6.42	—	—
	N obs.	32	32	0	—	—	—	—	32	32	32	31	31	—	30	23	23	1	0
1995 Near-surface measurements:																			
CH00.1M	Mean	0.2	1.98	—	100	37	60	4	11	10.7	95	146	7.7	99.3	9	10.4	4.7	12.6	—
	Median	0.2	2.1	—	100	40	100	1	11.5	10.8	93	140	7.6	100	6	9.1	4.7	7.7	—
	Minimum	0.2	0.3	—	100	19	0	1	0	8.4	79	112	7.2	64	4	1.6	1.4	-1	—
	Maximum	0.2	3.4	—	100	48	100	10	27	13.2	124	188	8.7	141	28	22.7	13.8	61.1	—
	Std. dev.	0	0.8	—	0	11	54.8	5.2	10.2	1.62	10.8	23.1	0.47	24.2	5.85	6.93	2.73	15.1	—
	N obs.	25	25	0	5	5	5	3	25	25	25	25	25	19	25	25	25	25	0
CN00.1M	Mean	0.2	2.18	—	100	25	80	5	10.6	11	96	606	8.2	71.5	14	29.9	6.5	—	—
	Median	0.2	2.2	—	100	25	80	5	10.9	11.5	92	597	8.2	70	11	19	6	—	—
	Minimum	0.2	0.66	—	100	25	80	5	-0.1	7	83	494	8	32	5	8.1	2.5	—	—
	Maximum	0.2	4.4	—	100	25	80	5	25	15.6	149	692	8.7	125	34	85.2	14.4	—	—
	Std. dev.	0	1.01	—	—	—	—	—	9.39	2.5	14.6	53	0.16	25.7	8.46	25.4	3.08	—	—
	N obs.	25	25	0	1	1	1	1	25	25	25	25	25	21	25	25	25	0	0
M738.2F	Mean	0.2	—	—	—	—	—	—	12	11.3	100	486	8.1	—	12	16.5	6	19.9	3.96
	Median	0.2	—	—	—	—	—	—	12	10.6	98	490	8.1	—	14	16.6	6.2	20.6	3.96
	Minimum	0.2	—	—	—	—	—	—	0.1	6.4	79	344	7.7	—	4	2.8	2.3	7.84	3.96
	Maximum	0.2	—	—	—	—	—	—	26.5	16.9	153	581	8.6	—	34	51.6	12	58	3.96
	Std. dev.	0	—	—	—	—	—	—	10.4	3.16	14.2	68.4	0.22	—	7.07	11.3	2.24	10.7	—
	N obs.	25	0	0	0	0	0	0	24	24	24	24	24	0	25	25	24	24	1
M742.6B	Mean	0.2	1.4	0.85	—	—	—	—	11.8	14.2	135	496	8.4	64.4	19	24.9	8.9	41.3	1.41
	Median	0.2	1.35	0.69	—	—	—	—	12.2	12.7	110	504	8.4	45	19	27.1	9.1	27.8	1.41
	Minimum	0.2	1.1	0.27	—	—	—	—	0.1	8.3	82	365	7.9	21	3	2.2	2.3	3.21	1.41
	Maximum	0.2	1.8	1.76	—	—	—	—	30.8	25	342	572	8.9	150	63	81.1	25.8	147	1.41
	Std. dev.	0	0.22	0.45	—	—	—	—	10.8	4.35	68.7	56.5	0.34	40.4	13.7	19.2	5.5	39.8	—
	N obs.	24	23	22	0	0	0	0	23	23	23	23	23	21	24	24	24	24	1

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1995 Near-surface measurements:																			
M742.8D	Mean	0.2	1.97	0.93	—	—	—	—	11.7	13.3	123	496	8.3	69.6	14	18.4	7	29.1	5.04
	Median	0.2	1.9	0.87	—	—	—	—	12.3	12.8	110	501	8.3	53	16	18.4	7.4	23.2	5.04
	Minimum	0.2	1.6	0.32	—	—	—	—	0.1	9.1	88	367	7.9	30	4	2.6	2.7	5.61	5.04
	Maximum	0.2	2.4	1.66	—	—	—	—	30.4	25	340	587	8.8	168	29	42.7	12.8	102	5.04
	Std. dev.	0	0.22	0.47	—	—	—	—	10.7	3.89	52.6	67.4	0.26	39.6	7.86	11.7	2.69	24.5	—
	N obs.	24	23	22	0	0	0	0	23	23	23	23	23	21	24	24	24	24	1
M745.2L	Mean	0.2	2.18	0.61	90	7	55	1	12.4	11.2	100	500	8.1	84	11	14.2	5.8	19	4.45
	Median	0.2	2.1	0.59	90	7	55	1	12.4	10.9	96	503	8.2	65	12	16.1	5.5	16.4	4.45
	Minimum	0.2	1.1	0.24	90	5	20	1	-0.1	6.6	83	348	7.8	45	3	2	2.1	6.42	4.45
	Maximum	0.2	2.9	1.1	90	8	90	1	27.3	17.1	136	599	8.6	190	17	27.9	14	60.5	4.45
	Std. dev.	0	0.46	0.25	0	2.12	49.5	0	10.6	2.87	12.9	73.2	0.21	40.7	4.49	7.32	2.35	11.4	—
	N obs.	24	24	23	2	2	2	2	24	24	24	24	24	23	24	24	23	24	1
M746.9Y	Mean	0.2	3.73	—	50	4	0	—	12.3	11	99	408	8.1	92.7	10	12.8	5	18	5.95
	Median	0.2	3.7	—	50	4	0	—	12.2	10.7	95	416	8.1	70	11	14	4.9	17.8	5.95
	Minimum	0.2	2.9	—	50	4	0	—	0.3	6.6	83	279	7.4	53	3	2.4	2.4	6.84	5.95
	Maximum	0.2	4.9	—	50	4	0	—	26.8	16.6	127	583	8.6	196	20	27.9	7.7	42.4	5.95
	Std. dev.	0	0.48	—	—	—	—	—	10.3	2.91	10.9	82	0.26	43.7	4.52	6.62	1.46	8.69	—
	N obs.	24	24	0	1	1	1	0	24	24	24	24	24	24	24	24	23	24	1
M747.3R	Mean	0.2	1.61	0.99	—	—	—	—	11.5	10.9	95	503	8.1	77.2	11	15.9	4.9	17.2	6.43
	Median	0.2	1.58	0.97	—	—	—	—	11.3	10.8	92	502	8.1	67.5	12	17.5	5	14.6	6.43
	Minimum	0.2	1.2	0.37	—	—	—	—	-0.1	6	75	353	7.8	52	3	2.2	2.2	5.7	6.43
	Maximum	0.2	2.2	1.92	—	—	—	—	26.4	16.7	125	597	8.5	151	22	40.5	8	49.9	6.43
	Std. dev.	0	0.26	0.49	—	—	—	—	10.3	2.98	11	71.9	0.19	26	5.34	9.75	1.58	9.42	—
	N obs.	25	25	24	0	0	0	0	25	25	25	25	25	20	25	25	25	25	1
M752.8Y	Mean	0.2	7.65	—	—	—	—	—	11.6	11.1	97	514	8.1	100	9	10.5	4.9	16.7	5.92
	Median	0.2	7.85	—	—	—	—	—	11.7	11.3	91	518	8.2	73	9	10.7	4.8	13.4	5.92
	Minimum	0.2	5.5	—	—	—	—	—	-0.1	6.6	83	364	7.6	55	3	2	2.4	7.11	5.92
	Maximum	0.2	9.4	—	—	—	—	—	26.7	16.7	141	629	8.6	230	18	23.8	7.5	47.4	5.92
	Std. dev.	0	1.03	—	—	—	—	—	10.2	3.14	13.6	79.5	0.23	52.2	3.86	5.7	1.31	9.01	—
	N obs.	24	22	0	0	0	0	0	23	23	23	23	23	23	24	24	23	24	1
M752.8Z	Mean	0.2	2.86	—	—	—	—	—	11.8	10.9	97	352	8	84.4	12	16.3	5.6	17.8	5.13
	Median	0.2	2.8	—	—	—	—	—	11.8	11	94	326	8	65	12	18	6	16.8	5.13
	Minimum	0.2	2.1	—	—	—	—	—	-0.1	6.8	82	217	7.4	39	4	3	2.5	6.24	5.13
	Maximum	0.2	5.5	—	—	—	—	—	26.4	16.4	117	569	8.6	181	23	31.2	7.4	38.2	5.13
	Std. dev.	0	0.71	—	—	—	—	—	10.3	2.79	10.2	96	0.27	44.5	5.43	8.61	1.5	8.15	—
	N obs.	24	24	0	0	0	0	0	24	24	24	24	24	24	24	24	23	24	1

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1995 Near-surface measurements:																			
M753.1X	Mean	0.2	1.92	0.26	100	13	26	2	11.6	11.5	102	517	8.2	77.6	9	11.3	5.1	18	—
	Median	0.2	1.85	0.25	100	15	0	1	12.3	12.3	93	512	8.2	66.5	11	13.5	5.3	14.4	—
	Minimum	0.2	1.5	0.07	100	2	0	1	0	6.2	76	364	7.8	50	3	2.6	2	5.61	—
	Maximum	0.2	4.8	0.58	100	25	100	5	26.8	18.2	163	640	8.8	146	14	18.9	8.8	45.6	—
	Std. dev.	0	0.62	0.15	0	7.83	39.5	2.3	10.3	3.19	20.6	78.6	0.24	28	3.9	5.77	1.63	11.5	—
	N obs.	25	25	24	7	7	7	3	25	25	25	25	25	22	25	25	25	25	0
M757.2Z	Mean	0.2	3.74	0.16	100	26	49	2	11.6	12.1	110	318	8.1	85.4	10	12	5.6	22.1	—
	Median	0.2	3.7	0.16	100	26	60	2	11.7	11.5	95	342	8	81	10	13.6	5.4	16.4	—
	Minimum	0.2	3.3	0.02	100	11	0	1	0	7.8	79	180	7.4	38	3	3.1	1.9	4.99	—
	Maximum	0.2	4.5	0.34	100	37	100	5	29.2	25	331	483	9	156	25	27.9	11.1	94.1	—
	Std. dev.	0	0.25	0.1	0	8.71	44.1	1.5	10.7	3.75	48.5	96.6	0.38	36.1	5.57	7.03	2.27	21.2	—
	N obs.	25	25	23	7	7	7	5	25	25	25	25	25	25	25	25	25	25	0
M764.3A	Mean	0.2	5.76	—	—	—	—	—	12	11.5	102	536	8.2	108	8	7.8	4.6	16.3	—
	Median	0.2	5.9	—	—	—	—	—	12.1	11.4	93	543	8.2	92.5	7	7.7	4.5	12.8	—
	Minimum	0.2	4.3	—	—	—	—	—	0.3	5.9	73	384	7.8	53	3	2.4	1.7	-1	—
	Maximum	0.2	7.9	—	—	—	—	—	27	20	175	653	8.8	221	15	15.9	6.8	47.8	—
	Std. dev.	0	0.87	—	—	—	—	—	10.1	3.71	25.4	76.2	0.26	47.3	3.31	3.64	1.56	11.6	—
	N obs.	25	24	0	0	0	0	0	25	25	25	25	25	24	25	25	25	25	0
M766.0I	Mean	0.2	6.64	—	100	39	46	5	15.1	11.4	111	536	8.3	93.3	8	8.3	5.3	25.8	—
	Median	0.2	6.7	—	100	39	50	3	16.5	10.9	101	561	8.3	82.5	8	7.6	5.3	18.1	—
	Minimum	0.2	5.4	—	100	16	0	1	0.1	6.5	78	372	7.8	48	3	-0.1	-0.1	5.35	—
	Maximum	0.2	8	—	100	54	100	12	27.9	21	271	658	8.9	225	15	16.5	9.4	104	—
	Std. dev.	0	0.69	—	0	13.7	42.4	4.4	10.3	3.83	37.5	78.2	0.29	36.7	3.18	4.3	2.17	21.2	—
	N obs.	36	36	0	7	7	7	5	36	35	35	36	36	36	36	25	24	25	0
M771.2P	Mean	0.2	8.55	—	100	37	49	4	14.9	10.7	102	535	8.2	82.9	10	10	4.9	21.9	—
	Median	0.2	8.45	—	100	34	50	2	16.8	10.9	95	547	8.2	73	10	8.9	4.9	17.6	—
	Minimum	0.2	7.8	—	100	10	0	1	0.1	6.1	74	377	7.6	40	3	3.6	1.3	5.13	—
	Maximum	0.2	9.5	—	100	54	100	10	28.2	17.7	149	660	8.7	187	20	21.3	7.7	86.8	—
	Std. dev.	0	0.51	—	0	15.5	45.6	3.7	10.3	3.21	21.4	79.8	0.26	35	4.34	4.77	1.54	17.4	—
	N obs.	36	36	0	7	7	7	5	36	36	36	36	36	36	36	25	25	25	0
M775.6Q	Mean	0.2	8.83	—	100	33	67	4	15.1	10.6	102	539	8.2	71.8	14	13.5	6.2	23.9	—
	Median	0.2	8.7	—	100	32	80	4	16.6	10.6	94	539	8.2	57.5	15	17	6.7	16.2	—
	Minimum	0.2	8	—	100	10	0	1	0	6.1	72	376	7.8	35	2	2.2	2.8	5.99	—
	Maximum	0.2	9.9	—	100	50	100	10	28.7	17.4	183	675	8.9	215	29	23.7	9.5	68.9	—
	Std. dev.	0	0.58	—	0	15	43.5	3.3	10.3	3.39	26.6	79.7	0.27	42.2	6.27	6.81	1.93	19.1	—
	N obs.	36	36	0	7	7	7	6	36	36	36	36	36	36	36	24	23	25	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1995 Near-surface measurements:																			
M781.2O	Mean	0.2	5.83	—	100	34	55	4	15.2	10.7	103	530	8.2	65.1	18	18.2	6.9	20.7	—
	Median	0.2	5.8	—	100	36	65	2	16.4	10.3	97	532	8.2	49.5	16	16.8	7	18.2	—
	Minimum	0.2	5	—	100	5	0	2	0.1	5.2	66	375	7.7	22	3	2.6	2.5	6.36	—
	Maximum	0.2	6.8	—	100	53	100	10	29.9	16	182	666	8.7	181	58	75	16.3	46.4	—
	Std. dev.	0	0.56	—	0	17.7	42.5	3.5	10.6	3	24.8	73.4	0.25	43.7	11.2	15.1	3.24	10.7	—
	N obs.	36	36	0	6	6	6	5	36	36	36	36	36	36	36	25	25	25	0
M786.2C	Mean	0.2	6	—	90	2	90	1	12.4	10.7	95	530	8.1	75.9	24	35.9	8.1	19.6	—
	Median	0.2	5.8	—	90	2	90	1	12.4	11.4	93	540	8.1	45.5	24	38.3	8.7	16	—
	Minimum	0.2	4.8	—	90	2	90	1	0.5	6.1	77	373	7.8	25	3	3.3	2	3.74	—
	Maximum	0.2	8.2	—	90	2	90	1	26.5	14.7	127	677	8.6	221	44	66.5	13.4	59.1	—
	Std. dev.	0	0.84	—	—	—	—	—	10	2.93	11.9	73.2	0.2	66.8	13.2	21.1	3.47	12.8	—
	N obs.	24	24	0	1	1	1	1	24	24	24	24	24	24	24	24	24	24	0
M786.5D	Mean	0.2	3	—	70	5	17	0	12.1	10.8	96	506	8.1	70.1	24	34.9	8	22.9	—
	Median	0.2	2.8	—	80	3	0	0	12.3	11.3	93	521	8.1	45	24	37.8	8.7	17.1	—
	Minimum	0.2	1.96	—	30	2	0	0	0.1	6.6	78	340	7.8	22	2	2.2	2	3.37	—
	Maximum	0.2	4.3	—	100	10	50	1	27.1	15.1	124	656	8.5	232	53	80.7	14.5	116	—
	Std. dev.	0	0.65	—	36.1	4.36	28.9	.58	10.2	2.84	10.7	73.5	0.2	62.2	14.5	22.3	3.6	22.6	—
	N obs.	24	24	0	3	3	3	3	24	24	24	24	24	23	24	24	24	24	0
M796.9M	Mean	0.2	8.24	—	—	—	—	—	12.5	10.9	98	545	8.1	82.9	26	38	8.4	21.2	—
	Median	0.2	7.8	—	—	—	—	—	13	12.3	96	554	8.1	39	27	45.1	9.7	17.1	—
	Minimum	0.2	2	—	—	—	—	—	0.9	6.4	81	374	7.7	19	3	1.2	2.1	3.37	—
	Maximum	0.2	15.8	—	—	—	—	—	27.4	14.9	131	710	8.6	280	54	75.7	13.3	75.8	—
	Std. dev.	0	2.54	—	—	—	—	—	10	2.93	12.3	79.6	0.2	82.9	16.3	25.4	3.82	17.5	—
	N obs.	25	25	0	0	0	0	0	25	25	25	25	25	24	25	25	24	24	0
M796.9N	Mean	0.2	6.41	—	—	—	—	—	11.8	10.9	96	496	8.1	83.6	23	34.8	7.9	17.5	—
	Median	0.2	5.9	—	—	—	—	—	11.9	11	95	514	8.1	49	24	41.6	8.9	15.5	—
	Minimum	0.2	3.7	—	—	—	—	—	0.6	6.4	79	328	7.7	21	3	2.1	1.6	2.62	—
	Maximum	0.2	9.8	—	—	—	—	—	26.6	15.2	119	664	8.5	271	48	69	14.7	45.3	—
	Std. dev.	0	1.82	—	—	—	—	—	9.9	2.87	9.43	78.3	0.18	77.6	14.3	22.3	3.63	11	—
	N obs.	25	25	0	0	0	0	0	25	25	25	25	25	25	25	25	24	24	0
VM00.1M	Mean	0.2	3.67	—	98.6	10	43	1	11.3	11	96	595	8.1	65.4	20	25	7.7	—	—
	Median	0.2	3.5	—	100	12	3	1	11.1	11.5	90	601	8.1	51.5	15	22.5	8	—	—
	Minimum	0.2	2.6	—	90	2	0	0	0.1	5.6	62	442	7.7	20	2	1.7	1.2	—	—
	Maximum	0.2	5.2	—	100	16	100	1	27.2	17.7	147	689	8.7	236	63	68.6	16.9	—	—
	Std. dev.	0	0.79	—	3.78	5.19	53.1	0.5	10.3	3.58	22.8	63.6	0.25	51.8	15.2	18.9	4.08	—	—
	N obs.	25	25	0	7	7	7	4	25	25	25	25	25	22	25	25	25	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1995 Near-surface measurements:																			
WW01.3M	Mean	0.2	—	—	100	16	100	1	10.3	10.9	95	551	8	—	13	23.9	4.6	—	—
	Median	0.2	—	—	100	16	100	1	10.6	11	96	552	8	—	8	14.2	3.6	—	—
	Minimum	0.2	—	—	100	12	100	1	0	8.5	81	516	7.8	—	3	5.1	1.7	—	—
	Maximum	0.2	—	—	100	19	100	1	22.1	13.5	103	567	8.3	—	94	144	18.2	—	—
	Std. dev.	0	—	—	0	4.95	0	0	7.5	1.65	5.53	12	0.13	—	18	28.9	3.35	—	—
	N obs.	25	0	0	2	2	2	2	24	24	24	24	24	0	24	24	24	0	0
ZM00.1M	Mean	0.2	1.36	—	100	22	63	2	12	10.9	99	589	8.2	59.8	20	41	7.4	28.4	—
	Median	0.2	1.48	—	100	23	75	2	12	10.8	96	582	8.2	54.5	12	27.9	6	28.4	—
	Minimum	0.2	0.5	—	100	12	10	1	-0.1	7.7	77	506	7.8	12	4	4.6	1.5	28.4	—
	Maximum	0.2	2.3	—	100	28	100	3	30.8	13.7	134	690	8.5	111	110	211	26.4	28.4	—
	Std. dev.	0	0.51	—	0	6	42.3	.98	10.4	1.41	15	40.3	0.22	27.1	24.4	52.5	6.27	—	—
	N obs.	24	24	0	6	6	6	6	24	24	24	24	24	16	24	24	24	1	0
1995 Near-bottom measurements:																			
M753.1X	Mean	1.72	1.92	—	—	—	—	—	11.5	11.4	101	517	8.2	—	—	—	—	—	—
	Median	1.7	1.85	—	—	—	—	—	12.3	12.2	93	513	8.2	—	—	—	—	—	—
	Minimum	1.3	1.5	—	—	—	—	—	0	6	75	365	7.8	—	—	—	—	—	—
	Maximum	4.6	4.8	—	—	—	—	—	26.3	18.4	153	640	8.8	—	—	—	—	—	—
	Std. dev.	0.63	0.62	—	—	—	—	—	10.2	3.25	19.7	78.8	0.24	—	—	—	—	—	—
	N obs.	25	25	0	—	—	—	—	25	25	25	25	25	—	0	0	0	0	0
M757.2Z	Mean	3.55	3.74	—	—	—	—	—	11	11.1	96	333	8	—	—	—	—	—	—
	Median	3.6	3.7	—	—	—	—	—	11.7	10.9	91	367	8	—	—	—	—	—	—
	Minimum	3.1	3.3	—	—	—	—	—	0	5.6	69	177	7.4	—	—	—	—	—	—
	Maximum	4.3	4.5	—	—	—	—	—	26	18.4	129	531	8.6	—	—	—	—	—	—
	Std. dev.	0.26	0.25	—	—	—	—	—	9.92	3.31	12.7	108	0.28	—	—	—	—	—	—
	N obs.	25	25	0	—	—	—	—	25	25	25	25	25	—	0	0	0	0	0
M764.3A	Mean	5.56	5.76	—	—	—	—	—	12	9.91	87	539	8.1	—	10	10	5.3	—	—
	Median	5.7	5.9	—	—	—	—	—	12.2	10.6	86	554	8.1	—	10	9.9	5.6	—	—
	Minimum	4.1	4.3	—	—	—	—	—	0.3	2.7	33	386	7.6	—	3	3.1	2	—	—
	Maximum	7.7	7.9	—	—	—	—	—	25.9	15.9	140	662	8.7	—	22	22	9.3	—	—
	Std. dev.	0.87	0.87	—	—	—	—	—	9.63	3.46	19.1	78.8	0.23	—	4.46	4.59	1.72	—	—
	N obs.	24	24	0	—	—	—	—	24	24	24	24	24	—	24	24	24	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1995 Near-bottom measurements:																			
M766.0I	Mean	6.44	6.64	—	—	—	—	—	14.5	8.67	80	545	8	—	12	11	4.7	—	—
	Median	6.5	6.7	—	—	—	—	—	15.6	8.6	82	573	8	—	10	9.6	4.6	—	—
	Minimum	5.2	5.4	—	—	—	—	—	0.4	4.1	50	373	7.6	—	3	1.9	1.5	—	—
	Maximum	7.8	8	—	—	—	—	—	26.7	13.4	120	663	8.6	—	41	41.7	8.3	—	—
	Std. dev.	0.69	0.69	—	—	—	—	—	9.21	3.12	16.6	80.9	0.24	—	8.04	8.4	1.75	—	—
	N obs.	36	36	0	—	—	—	—	36	36	36	36	36	—	35	25	25	0	0
M771.2P	Mean	8.35	8.55	—	—	—	—	—	14.1	8.33	75	544	8	—	15	13.1	5.4	—	—
	Median	8.25	8.45	—	—	—	—	—	15.6	8.35	80	562	7.9	—	15	12.9	5.4	—	—
	Minimum	7.6	7.8	—	—	—	—	—	0.6	0.1	1	378	7.5	—	3	2.6	2.4	—	—
	Maximum	9.3	9.5	—	—	—	—	—	25.7	16.9	124	668	8.6	—	36	37.1	8.3	—	—
	Std. dev.	0.51	0.51	—	—	—	—	—	9.15	4.04	26.7	80.9	0.27	—	7.51	8.13	1.91	—	—
	N obs.	36	36	0	—	—	—	—	36	36	36	36	36	—	36	25	25	0	0
M775.6Q	Mean	8.63	8.83	—	—	—	—	—	14.2	8.38	76	545	8	—	20	20.3	6.8	—	—
	Median	8.5	8.7	—	—	—	—	—	16	8.05	80	551	7.9	—	19	21.3	7.5	—	—
	Minimum	7.8	8	—	—	—	—	—	0.1	0	0	378	7.6	—	3	2.6	2.1	—	—
	Maximum	9.7	9.9	—	—	—	—	—	25.6	14.4	131	661	8.6	—	57	60.1	14.7	—	—
	Std. dev.	0.58	0.58	—	—	—	—	—	9.26	3.89	25.1	79.3	0.26	—	12	14.8	3.04	—	—
	N obs.	36	36	0	—	—	—	—	36	36	36	36	36	—	36	25	25	0	0
M781.2O	Mean	5.63	5.83	—	—	—	—	—	14.1	8.21	73	539	8	—	29	31.4	7.8	—	—
	Median	5.6	5.8	—	—	—	—	—	15.7	8.4	84	544	7.9	—	26	27.9	7.4	—	—
	Minimum	4.8	5	—	—	—	—	—	0.2	1.8	19	375	7.6	—	3	2.1	2.2	—	—
	Maximum	6.6	6.8	—	—	—	—	—	26.4	14.6	123	667	8.6	—	86	106	17.7	—	—
	Std. dev.	0.56	0.56	—	—	—	—	—	9.39	4.17	27.2	78.6	0.25	—	19.8	26	4.32	—	—
	N obs.	36	36	0	—	—	—	—	36	36	36	36	35	—	36	25	25	0	0
1996 Near-surface measurements:																			
CH00.1M	Mean	0.2	1.41	—	100	18	100	4	10.3	10.2	89	139	7.6	90.8	8	10	4	9.49	—
	Median	0.2	1.08	—	100	18	100	4	9.1	10.4	93	133	7.7	91	7	10.6	4.3	5.99	—
	Minimum	0.2	0.28	—	100	18	100	4	0	7.8	64	67	7	58	3	0.8	0.4	-1	—
	Maximum	0.2	3.2	—	100	18	100	4	23.6	13.1	107	207	8.1	115	23	27.6	7.8	29.1	—
	Std. dev.	0	0.87	—	—	—	—	—	9.77	1.57	11.4	38.9	0.35	17.6	4.39	6.1	1.8	10	—
	N obs.	24	24	0	1	1	1	1	23	23	23	23	23	15	24	24	24	23	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1996 Near-surface measurements:																			
CN00.1M	Mean	0.2	2.41	0.36	100	42	88	7	10.7	10.6	93	556	8.1	66.9	23	49	9	—	—
	Median	0.2	2.25	0.36	100	49	100	7	9.95	11.2	92	590	8.1	62	14	22.3	6.3	—	—
	Minimum	0.2	1.29	0.36	100	17	50	3	-0.1	6.9	75	365	7.8	10	3	6	1.6	—	—
	Maximum	0.2	5.1	0.36	100	52	100	10	24.7	13.5	126	699	8.4	129	150	356	50	—	—
	Std. dev.	0	0.96	—	0	16.6	25	3	9.1	1.85	12	100	0.15	31.3	31.2	77.8	10.4	—	—
	N obs.	24	24	1	4	4	4	4	24	24	24	24	24	20	24	24	23	0	0
M738.2F	Mean	0.2	—	—	—	—	—	—	11.4	10.5	94	417	8.1	—	16	17.1	5.7	15.4	—
	Median	0.2	—	—	—	—	—	—	10.8	10.7	97	392	8.1	—	12	14.7	5.5	16.5	—
	Minimum	0.2	—	—	—	—	—	—	0	6.7	58	334	7.4	—	3	2.4	1.5	-1	—
	Maximum	0.2	—	—	—	—	—	—	25.1	13.6	120	534	8.5	—	120	84.1	18.3	50	—
	Std. dev.	0	—	—	—	—	—	—	9.88	1.91	14.6	59.6	0.34	—	23.4	16.9	3.62	13.7	—
	N obs.	23	0	0	0	0	0	0	23	23	23	23	23	0	23	23	22	22	0
M742.6B	Mean	0.2	1.48	0.82	—	—	—	—	11.5	12.7	119	440	8.4	42.4	27	28	9.2	37.9	—
	Median	0.2	1.42	0.59	—	—	—	—	10.6	12.8	107	423	8.6	35.5	19	25.4	9.8	35.1	—
	Minimum	0.2	1.12	0.2	—	—	—	—	0	8.1	69	329	7.6	8	3	2.2	1.5	-1	—
	Maximum	0.2	2.3	2.28	—	—	—	—	25.6	25	306	592	9.1	140	222	116	26.7	132	—
	Std. dev.	0	0.3	0.53	—	—	—	—	10	3.25	50.8	65.5	0.46	28.3	44.2	25.1	6.23	38.4	—
	N obs.	23	23	22	0	0	0	0	23	23	23	23	23	16	23	23	22	23	0
M742.8D	Mean	0.2	1.9	0.88	—	—	—	—	11.2	11.4	104	432	8.3	61.1	16	18.7	7.2	29.5	—
	Median	0.2	1.9	0.62	—	—	—	—	10.5	11.7	96	410	8.3	46	16	19.3	7.8	18.5	—
	Minimum	0.2	1.5	0.23	—	—	—	—	0	6.6	70	345	7.5	19	3	2.1	1.4	-1	—
	Maximum	0.2	2.5	1.8	—	—	—	—	25.8	14.1	151	535	9	165	58	59.9	14.5	126	—
	Std. dev.	0	0.24	0.52	—	—	—	—	9.91	1.56	25.1	59.7	0.44	39.3	12.6	14.1	4.3	34.8	—
	N obs.	23	23	22	0	0	0	0	23	23	23	23	23	19	23	23	22	23	0
M745.2L	Mean	0.2	2.07	0.42	73.3	28	95	9	11.7	10.9	99	426	8.1	82.9	13	15.8	5.2	15	—
	Median	0.2	2.1	0.39	100	32	95	9	11.8	11.1	97	406	8.2	80	10	11.9	5.1	14.3	—
	Minimum	0.2	1.2	0.16	20	2	90	5	0	6.7	72	339	7.5	15	3	2.4	0.7	-1	—
	Maximum	0.2	2.9	0.88	100	49	100	12	25.8	13.3	149	560	8.7	132	89	86.5	17.4	46.4	—
	Std. dev.	0	0.48	0.21	46.2	23.8	7.07	4.9	10	1.77	18.5	65.5	0.33	28.6	17.7	18.9	3.44	13.8	—
	N obs.	23	23	20	3	3	2	2	23	23	23	23	23	21	23	23	22	22	0
M746.9Y	Mean	0.2	3.56	—	100	9	70	1	11.2	10.7	96	340	8	112	8	8.5	3.9	11.9	—
	Median	0.2	3.55	—	100	9	70	1	10.2	11.1	93	358	8.1	90	9	8.6	4.2	7.7	—
	Minimum	0.2	3	—	100	9	70	1	0.1	7.1	78	122	7.1	54	3	1.9	0.7	-1	—
	Maximum	0.2	4.5	—	100	9	70	1	25.7	13.2	141	459	8.7	225	18	20.9	7	40.7	—
	Std. dev.	0	0.41	—	—	—	—	—	9.93	1.72	15.7	77.6	0.41	47	3.97	5.04	1.75	11	—
	N obs.	24	24	0	1	1	1	1	24	24	24	24	24	23	24	24	23	24	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1996 Near-surface measurements:																			
M747.3R	Mean	0.2	1.52	0.86	100	10	10	—	11.5	10.7	96	428	8.1	80.8	16	20.7	5.2	13.4	—
	Median	0.2	1.5	0.73	100	10	10	—	11.1	11.3	92	406	8.1	80.5	9	12.4	4.9	15	—
	Minimum	0.2	1.05	0.22	100	10	10	—	0	6.7	72	343	7.4	15	3	1.4	0.5	-1	—
	Maximum	0.2	2.6	2.06	100	10	10	—	25.6	13.2	141	568	8.7	150	110	132	20.1	42.6	—
	Std. dev.	0	0.33	0.49	—	—	—	—	9.95	1.84	16.9	63.9	0.33	33.1	23.3	32.2	4.21	11.6	—
	N obs.	23	23	22	1	1	1	0	23	23	23	23	23	18	23	23	22	23	0
M752.8Y	Mean	0.2	7.57	—	—	—	—	—	11.5	10.4	94	444	8.1	115	8	8	3.9	12.2	—
	Median	0.2	7.9	—	—	—	—	—	11.6	10.5	92	419	8.1	94.5	7	8.8	4.6	12.1	—
	Minimum	0.2	4.4	—	—	—	—	—	0	6.4	71	335	7.5	64	3	1.6	0.7	-1	—
	Maximum	0.2	9.1	—	—	—	—	—	25.1	13.1	133	585	8.6	217	18	16.7	6.3	33.5	—
	Std. dev.	0	1	—	—	—	—	—	9.91	1.88	15.4	66.3	0.32	46.6	4.23	4.43	1.82	10.7	—
	N obs.	23	23	0	0	0	0	0	23	23	23	23	23	22	23	23	22	23	0
M752.8Z	Mean	0.2	3.18	—	—	—	—	—	11.2	10.3	92	294	7.9	101	10	11.6	4.3	13.4	—
	Median	0.2	3.1	—	—	—	—	—	10.2	10.6	93	291	8	79.5	10	12.3	5.4	8.55	—
	Minimum	0.2	1.8	—	—	—	—	—	0	7.2	66	86	7.2	57	3	2.6	0.7	-1	—
	Maximum	0.2	6.4	—	—	—	—	—	25.1	13.5	126	435	8.6	212	17	22.5	6.8	34.3	—
	Std. dev.	0	1.06	—	—	—	—	—	9.84	1.64	14.6	81.6	0.4	48.1	4.27	6.57	2	11.9	—
	N obs.	23	23	0	0	0	0	0	23	23	23	23	23	22	23	23	22	23	0
M753.1X	Mean	0.2	1.92	0.18	100	27	63	6	11.4	11	100	454	8.2	103	7	7.6	3.9	10.6	—
	Median	0.2	1.89	0.12	100	25	100	4	11.2	10.9	95	435	8.2	88	7	8.4	4	8.05	—
	Minimum	0.2	1.27	0.03	100	5	0	4	0	6.3	68	336	7.4	57	2	1.9	0.9	-1	—
	Maximum	0.2	3.8	0.85	100	48	100	12	26	13.9	173	587	8.7	166	17	14.6	6.7	31.7	—
	Std. dev.	0	0.43	0.19	0	16	51.8	3.5	10.4	1.84	24.8	65.9	0.37	32.5	4.23	4.15	1.71	9.39	—
	N obs.	24	24	23	8	8	8	5	24	24	24	24	24	23	24	24	23	24	0
M757.2Z	Mean	0.2	3.7	0.17	89.4	28	61	7	11.6	11.1	104	267	7.9	82.9	9	9.3	4.5	16.5	—
	Median	0.2	3.6	0.12	100	26	95	7	12.8	10.4	94	284	7.9	79.5	7	8.5	5	7.49	—
	Minimum	0.2	3.2	0.04	5	1	0	3	0	6.8	59	71	6.8	41	3	1.9	0.8	-1	—
	Maximum	0.2	5.2	0.75	100	52	100	12	27.3	25	319	406	9.2	130	18	19.4	8.6	89.3	—
	Std. dev.	0	0.42	0.15	31.7	17.9	50.8	3.5	10.5	3.65	51.6	79.7	0.58	26	4.46	5.56	2.36	22.1	—
	N obs.	25	25	23	9	9	8	5	25	25	25	25	25	24	24	24	23	24	0
M764.3A	Mean	0.2	5.31	—	—	—	—	—	11.2	10.1	89	477	8	130	6	5.5	3.4	11.9	—
	Median	0.2	5.05	—	—	—	—	—	11.1	10.7	88	469	8.1	114	6	5.6	3.4	10.9	—
	Minimum	0.2	3.7	—	—	—	—	—	0.1	6	72	348	7.4	60	3	1.4	0.6	-1	—
	Maximum	0.2	7.6	—	—	—	—	—	25.4	13	106	614	8.4	267	17	11	6.2	32.4	—
	Std. dev.	0	1.29	—	—	—	—	—	10.2	2.1	9.77	68.8	0.28	54.3	3.41	2.46	1.41	10.4	—
	N obs.	24	24	0	0	0	0	0	23	23	23	23	23	24	24	24	24	24	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1996 Near-surface measurements:																			
M766.0I	Mean	0.2	6.69	—	98.9	41	62	6	14.1	10	95	476	8.2	110	7	6.3	3.8	14.6	—
	Median	0.2	6.6	—	100	41	90	7	16.8	10.1	89	461	8.2	108	6	6	3.7	11.3	—
	Minimum	0.2	5.5	—	90	17	0	0	0	6.1	70	327	7.5	64	3	2.6	1.3	-1	—
	Maximum	0.2	8.8	—	100	73	100	14	25.7	14.1	144	627	8.8	198	15	13	6.9	32.8	—
	Std. dev.	0	0.83	—	3.33	21.6	47.1	4.4	10.4	2.08	16.8	74.8	0.29	33	2.99	2.66	1.58	10.5	—
	N obs.	33	33	0	9	9	9	7	31	31	31	31	31	32	33	24	24	24	0
M771.2P	Mean	0.2	8.44	—	100	45	73	7	14.1	9.68	91	479	8.1	94.4	9	7.2	4.1	15.7	—
	Median	0.2	8.3	—	100	45	90	8	16.7	9.4	85	458	8.2	85	9	7.3	4.3	15.1	—
	Minimum	0.2	7.7	—	100	20	0	0	0	6.4	72	336	7.6	40	2	-0.1	1.6	-1	—
	Maximum	0.2	10.7	—	100	76	100	14	26	13.2	127	613	8.7	201	21	19.2	7.6	41.9	—
	Std. dev.	0	0.7	—	0	21.4	42.1	4.6	10.4	2.15	13.2	73.3	0.28	35.8	4.32	4.2	1.72	12.3	—
	N obs.	33	33	0	9	9	9	7	31	31	31	31	31	33	33	24	24	23	0
M775.6Q	Mean	0.2	8.67	—	100	39	63	7	14.2	10.3	98	473	8.2	75	11	10.1	4.7	16.9	—
	Median	0.2	8.4	—	100	39	100	6	16.1	11.4	90	462	8.1	70	10	10.4	5	14.8	—
	Minimum	0.2	7.9	—	100	15	0	5	0	6.2	72	309	7.7	35	3	2.7	1	-1	—
	Maximum	0.2	10.9	—	100	66	100	9	27.4	12.9	157	627	8.6	163	24	24.1	10.4	53.9	—
	Std. dev.	0	0.69	—	0	19.2	51.8	1.8	10.4	2.18	20.3	72.2	0.3	26.8	5.02	5.13	2.1	14	—
	N obs.	33	33	0	8	8	8	5	32	32	32	32	32	33	33	24	24	24	0
M781.2O	Mean	0.2	5.67	—	100	38	59	5	14.2	10.2	97	465	8.1	58.8	16	15.2	5.5	18	—
	Median	0.2	5.5	—	100	37	100	6	15.9	11.2	91	454	8.1	48	16	16.3	6.3	15.3	—
	Minimum	0.2	4.9	—	100	18	0	0	0	5.1	61	256	7.7	27	3	2.2	1.2	-1	—
	Maximum	0.2	7.8	—	100	63	100	10	26.6	13.2	155	616	8.6	153	30	34.6	9.5	54.4	—
	Std. dev.	0	0.66	—	0	16.4	51.8	3.9	10.5	2.35	19.9	74.5	0.26	30.6	8.05	9.45	2.63	15.7	—
	N obs.	33	33	0	7	7	7	6	32	32	32	32	32	31	33	24	23	24	0
M786.2C	Mean	0.2	5.39	—	—	—	—	—	11.9	10.4	92	479	8	74.8	19	27.4	6.5	18	—
	Median	0.2	5.3	—	—	—	—	—	11.4	11.3	91	463	8.1	50.5	21	28.8	7.5	16.8	—
	Minimum	0.2	4	—	—	—	—	—	0.3	6.7	77	327	7.6	31	3	2.5	1	-1	—
	Maximum	0.2	7.2	—	—	—	—	—	26	13.7	112	659	8.6	200	35	53.9	11.3	74.6	—
	Std. dev.	0	0.95	—	—	—	—	—	10.3	2.42	7.42	79	0.24	55	10.9	17.2	3.14	16.8	—
	N obs.	24	24	0	0	0	0	0	24	24	24	24	24	24	24	24	24	24	0
M786.5D	Mean	0.2	2.73	—	95	8	24	1	11.7	10.6	94	458	8	69.7	19	25.7	6.7	17	—
	Median	0.2	2.45	—	95	6	3	1	10.9	11.5	93	439	8.1	52	20	26.9	7.5	15.6	—
	Minimum	0.2	1.8	—	90	3	0	1	0	6.9	78	262	7.6	25	3	2.2	1.1	-1	—
	Maximum	0.2	5.2	—	100	17	90	1	25.8	13.3	126	628	8.7	190	35	51.4	11.8	81.3	—
	Std. dev.	0	0.72	—	5.77	6.4	44.2	—	10.3	2.14	11.7	80.5	0.25	48.6	11.4	17.4	3.63	17.6	—
	N obs.	24	24	0	4	4	4	1	24	24	24	24	24	23	24	24	23	24	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1996 Near-surface measurements:																			
M796.9M	Mean	0.2	6.54	—	—	—	—	—	12.3	10.4	93	488	8	74.7	20	26.8	6.6	18	—
	Median	0.2	6.95	—	—	—	—	—	11.7	11.3	95	471	8.1	48	22	28	8	17.1	—
	Minimum	0.2	2.3	—	—	—	—	—	0.5	6.6	77	343	7.6	29	3	2.7	1	-1	—
	Maximum	0.2	12.2	—	—	—	—	—	26.8	13.9	111	686	8.5	195	40	64.2	11.9	73.4	—
	Std. dev.	0	2.5	—	—	—	—	—	10.4	2.45	7.86	87.7	0.24	54.3	11.9	18.9	3.57	17.2	—
	N obs.	24	24	0	0	0	0	0	24	24	24	24	24	24	24	24	23	24	0
M796.9N	Mean	0.2	5.08	—	—	—	—	—	11.9	10.3	92	448	8	77.3	17	24	6.3	15	—
	Median	0.2	4.9	—	—	—	—	—	10.7	11.1	91	439	8	51	20	26.6	7.1	12.1	—
	Minimum	0.2	2.4	—	—	—	—	—	0.2	6	73	213	7.6	32	3	2.6	1.3	-1	—
	Maximum	0.2	8	—	—	—	—	—	25.4	13.4	111	624	8.5	205	34	52.9	11	78.4	—
	Std. dev.	0	1.36	—	—	—	—	—	9.92	2.39	8.47	91	0.22	56	9.9	16.2	3.4	16.3	—
	N obs.	24	24	0	0	0	0	0	24	24	24	24	24	24	24	24	23	23	0
VM00.1M	Mean	0.2	3.53	0.11	98.3	11	65	3	11.3	10.5	97	544	8	65.1	22	24.9	7.9	—	—
	Median	0.2	3.25	0.11	100	12	90	1	10.3	10.1	84	534	8	53	21	25.4	8.6	—	—
	Minimum	0.2	2.5	0.11	90	1	0	0	0	4	45	356	7.4	20	3	3.7	0.9	—	—
	Maximum	0.2	6.1	0.11	100	20	100	8	27	25	317	732	8.6	166	58	57.5	15.5	—	—
	Std. dev.	0	0.92	—	4.08	7.84	47.2	3.3	10.4	3.98	53.1	80.4	0.34	43.7	15.7	17.1	4.67	—	—
	N obs.	24	24	1	6	6	6	5	24	24	24	24	24	24	24	24	23	0	0
WW01.3M	Mean	0.2	—	—	96.7	16	63	4	9.49	11	95	544	8	—	24	38.3	6.2	—	—
	Median	0.2	—	—	100	19	90	4	10.4	11.3	97	552	8.1	—	9	13.3	3.3	—	—
	Minimum	0.2	—	—	90	8	0	4	0	8.3	77	387	7.6	—	3	4.8	2.2	—	—
	Maximum	0.2	—	—	100	21	100	4	20.3	14.5	119	582	8.1	—	170	178	29	—	—
	Std. dev.	0	—	—	5.77	7	55.1	0	6.96	1.49	9.04	36.6	0.14	—	42.1	56.8	7.23	—	—
	N obs.	23	0	0	3	3	3	2	23	23	23	23	23	0	23	23	22	0	0
ZM00.1M	Mean	0.2	1.65	—	100	21	100	5	11.2	10.8	97	562	8.1	79.1	25	71	9.7	—	—
	Median	0.2	1.46	—	100	17	100	4	11.5	11.3	103	585	8.2	86	9	16.6	4.3	—	—
	Minimum	0.2	0.62	—	100	11	100	2	0	7.3	66	306	7.6	6	3	2.4	0.3	—	—
	Maximum	0.2	3.7	—	100	34	100	9	24.4	13.2	129	696	8.4	131	333	716	61.5	—	—
	Std. dev.	0	0.67	—	0	10.4	0	2.6	9.56	1.53	15.9	99.1	0.24	38	69.1	169	16.3	—	—
	N obs.	23	23	0	5	5	5	5	23	23	23	23	23	15	22	23	22	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1996 Near-bottom measurements:																			
M753.1X	Mean	1.73	1.93	—	—	—	—	—	11.5	10.7	97	456	8.1	—	—	—	—	—	—
	Median	1.7	1.9	—	—	—	—	—	12.5	10.7	91	436	8.1	—	—	—	—	—	—
	Minimum	1.1	1.27	—	—	—	—	—	0	6.1	69	336	7.4	—	—	—	—	—	—
	Maximum	3.6	3.8	—	—	—	—	—	25.6	13.7	139	587	8.7	—	—	—	—	—	—
	Std. dev.	0.44	0.44	—	—	—	—	—	10.1	1.8	21.4	66.9	0.37	—	—	—	—	—	—
	N obs.	23	23	0	—	—	—	—	23	23	23	23	23	—	0	0	0	0	0
M757.2Z	Mean	3.5	3.7	—	—	—	—	—	10.5	10.2	90	269	7.8	—	—	—	—	—	—
	Median	3.45	3.65	—	—	—	—	—	9.4	10.6	85	280	7.7	—	—	—	—	—	—
	Minimum	3	3.2	—	—	—	—	—	0	6.7	68	72	6.8	—	—	—	—	—	—
	Maximum	5	5.2	—	—	—	—	—	25.4	12.4	121	440	8.7	—	—	—	—	—	—
	Std. dev.	0.42	0.42	—	—	—	—	—	9.73	1.61	15.6	93.2	0.47	—	—	—	—	—	—
	N obs.	22	22	0	—	—	—	—	22	22	22	22	22	—	0	0	0	0	0
M764.3A	Mean	5.1	5.31	—	—	—	—	—	11.2	9.73	85	478	8	—	7	6.3	3.5	—	—
	Median	4.85	5.05	—	—	—	—	—	11.1	10.5	86	474	8.1	—	7	6.3	3.7	—	—
	Minimum	3.5	3.7	—	—	—	—	—	0.3	5.4	64	351	7.4	—	2	1.8	0.8	—	—
	Maximum	7.4	7.6	—	—	—	—	—	25	12.8	102	612	8.4	—	17	14.6	6.9	—	—
	Std. dev.	1.29	1.29	—	—	—	—	—	10	2.23	10.3	68.4	0.29	—	3.73	3.45	1.69	—	—
	N obs.	24	24	0	—	—	—	—	23	23	23	23	23	—	23	23	23	0	0
M766.0I	Mean	6.49	6.69	—	—	—	—	—	13.9	8.43	78	485	8	—	8	6.8	3.5	—	—
	Median	6.4	6.6	—	—	—	—	—	16.4	8.2	80	486	8.1	—	7	5.4	3	—	—
	Minimum	5.3	5.5	—	—	—	—	—	0.4	5.2	59	368	7.5	—	2	1.3	0.8	—	—
	Maximum	8.6	8.8	—	—	—	—	—	24.7	12.3	96	628	8.4	—	20	17.6	6.6	—	—
	Std. dev.	0.83	0.83	—	—	—	—	—	9.6	2.31	10.1	71.1	0.25	—	4.66	4.5	1.76	—	—
	N obs.	33	33	0	—	—	—	—	31	31	31	31	31	—	31	23	23	0	0
M771.2P	Mean	8.24	8.44	—	—	—	—	—	13.7	8.09	73	484	7.9	—	11	10.4	4.3	—	—
	Median	8.1	8.3	—	—	—	—	—	16.7	8.2	77	474	7.9	—	11	10.3	4.2	—	—
	Minimum	7.5	7.7	—	—	—	—	—	0.2	1.4	15	342	7.4	—	4	3	1.3	—	—
	Maximum	10.5	10.7	—	—	—	—	—	25	12.4	96	600	8.3	—	26	26.7	7	—	—
	Std. dev.	0.7	0.7	—	—	—	—	—	9.61	3.29	20.8	70.4	0.24	—	5.62	6.62	1.93	—	—
	N obs.	33	33	0	—	—	—	—	31	31	31	31	31	—	31	23	23	0	0
M775.6Q	Mean	8.47	8.67	—	—	—	—	—	13.7	8.65	78	482	7.9	—	15	14.9	5.3	—	—
	Median	8.2	8.4	—	—	—	—	—	16.6	8.6	80	464	7.9	—	16	13	5.6	—	—
	Minimum	7.7	7.9	—	—	—	—	—	0.3	2.4	28	334	7.6	—	4	2.5	0.8	—	—
	Maximum	10.7	10.9	—	—	—	—	—	25.5	12.6	111	629	8.4	—	29	31.7	9.3	—	—
	Std. dev.	0.69	0.69	—	—	—	—	—	9.95	3.06	16.2	74.6	0.21	—	7.81	9.72	2.68	—	—
	N obs.	33	33	0	—	—	—	—	31	31	31	31	31	—	32	24	24	0	0

Table E-1. Continued.

Sampling location	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
									1996 Near-bottom measurements:										
M781.2O	Mean	5.47	5.67	—	—	—	—	—	13.4	8.66	78	475	8	—	19	19.2	6.1	—	—
	Median	5.3	5.5	—	—	—	—	—	15.8	9	81	463	7.9	—	20	19.7	6.8	—	—
	Minimum	4.7	4.9	—	—	—	—	—	0	2.7	31	279	7.6	—	3	2.9	0.9	—	—
	Maximum	7.6	7.8	—	—	—	—	—	25.1	12.8	113	618	8.5	—	36	44.5	10.9	—	—
	Std. dev.	0.66	0.66	—	—	—	—	—	9.77	3.28	18.4	80.3	0.21	—	9.86	13	3.25	—	—
	N obs.	33	33	0	—	—	—	—	32	32	32	32	32	—	32	24	23	0	0

Table E-2. Annual summaries (1993–1996) of chemical measurements at fixed sites grouped into near-surface (less than or equal to 0.2 m below the surface) and near-bottom (less than or equal to 0.2 m above the substrate) categories. Below-surface chemical samples are infrequently collected.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
1993 Near-surface measurements:													
CH00.1M	Mean	2.07	0.04	0.81	0.12	0.06	4.91	18.5	1.5	—	—	6.83	—
	Median	1.95	-0.02	0.64	0.11	0.04	4.45	16.9	1.3	—	—	6.05	—
	Minimum	0.71	-0.02	0.32	0.024	0.014	2.42	15	1	—	—	3.39	—
	Maximum	4.64	0.1	2.99	0.22	0.19	8.5	23.6	3.1	—	—	12	—
	Std. dev.	1.052	0.035	0.578	0.062	0.044	1.544	3.073	0.517	—	—	2.343	—
	N obs.	19	22	22	19	22	22	10	15	0	0	14	0
CN00.1M	Mean	4.86	0.05	3.75	0.17	0.12	7.03	90.4	3.1	—	—	19.8	—
	Median	4.56	0.05	3.95	0.16	0.11	6.6	90	3	—	—	18.8	—
	Minimum	3.6	-0.02	0.69	0.026	0.031	4.82	58.1	2.57	—	—	12.7	—
	Maximum	6.08	0.1	5.03	0.3	0.28	9.97	103	4.2	—	—	27	—
	Std. dev.	0.724	0.043	1.025	0.086	0.07	1.482	14.45	0.471	—	—	4.296	—
	N obs.	18	22	22	19	22	22	10	15	0	0	14	0
M738.2F	Mean	3.84	0.04	2.55	0.16	0.11	6.54	67.8	2.83	—	—	23.2	—
	Median	3.94	0.05	2.46	0.17	0.095	6.07	61.1	2.7	—	—	16.6	—
	Minimum	2.18	-0.02	1.68	0.023	-0.01	2.53	57.5	2.43	—	—	11	—
	Maximum	5.04	0.1	3.74	0.25	0.25	9.5	86	3.74	—	—	116	—
	Std. dev.	0.809	0.034	0.595	0.073	0.07	1.871	11.56	0.403	—	—	26.89	—
	N obs.	15	17	17	15	17	17	6	10	0	0	14	0
M742.6B	Mean	4.5	0.03	2.95	0.15	0.081	6.18	76.5	2.53	—	—	14.2	—
	Median	3.87	0.02	2.67	0.17	0.051	6.03	77	2.7	—	—	13.5	—
	Minimum	2.41	-0.02	1.85	0.016	-0.01	2.39	63.3	1.48	—	—	6.13	—
	Maximum	12.8	0.1	4.78	0.27	0.19	8.47	88.6	3.48	—	—	22.2	—
	Std. dev.	2.357	0.032	0.828	0.085	0.061	1.596	8.107	0.586	—	—	3.626	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0
M742.8D	Mean	3.64	0.04	2.69	0.16	0.1	6.45	68.8	2.8	—	—	16.5	—
	Median	3.88	-0.02	2.53	0.18	0.071	6.18	59.5	2.7	—	—	15.4	—
	Minimum	2.04	-0.02	1.65	0.026	-0.01	2.79	58.8	2.23	—	—	12.5	—
	Maximum	4.79	0.1	4.88	0.26	0.23	8.79	90	3.72	—	—	25.8	—
	Std. dev.	0.795	0.041	0.787	0.084	0.072	1.764	13.15	0.458	—	—	3.65	—
	N obs.	15	18	18	15	18	18	6	11	0	0	14	0
M745.2L	Mean	3.74	0.05	2.73	0.15	0.12	6.7	56.9	2.86	—	—	16.7	—
	Median	3.76	0.04	2.57	0.15	0.11	6.08	59	2.6	—	—	15.9	—
	Minimum	2.55	-0.02	1.7	0.024	0.015	3.3	47.4	2.37	—	—	12.5	—
	Maximum	4.67	0.1	4.75	0.27	0.25	9.35	62.6	3.74	—	—	24.7	—
	Std. dev.	0.614	0.039	0.756	0.078	0.071	1.776	6.462	0.461	—	—	3.35	—
	N obs.	16	17	17	16	17	17	5	10	0	0	13	0

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1993 Near-surface measurements:							
M746.9Y	Mean	2.95	0.04	1.63	0.14	0.1	5.95	55.4	2.55	—	—	13.9	—
	Median	2.94	0.03	1.67	0.15	0.075	5.56	49.1	2.47	—	—	13.1	—
	Minimum	0.91	-0.02	-0.01	0.023	0.018	2.91	44.8	2	—	—	3.45	—
	Maximum	4.64	0.09	2.59	0.24	0.24	9.08	85.5	3.32	—	—	23.5	—
	Std. dev.	0.825	0.03	0.657	0.068	0.061	1.636	15.26	0.382	—	—	4.858	—
	N obs.	16	18	17	16	18	18	6	11	0	0	14	0
M747.3R	Mean	3.67	0.05	2.95	0.15	0.12	6.71	62.4	2.85	—	—	40.9	—
	Median	3.78	0.03	2.64	0.15	0.1	6.15	62.4	2.7	—	—	16.4	—
	Minimum	2.57	-0.02	1.8	0.024	0.023	3.49	54.4	2.41	—	—	12.6	—
	Maximum	4.41	0.1	5.3	0.29	0.25	9.62	78	3.72	—	—	316	—
	Std. dev.	0.54	0.035	0.903	0.08	0.07	1.765	9.623	0.417	—	—	83.01	—
	N obs.	16	17	16	16	17	17	5	10	0	0	13	0
M752.8Y	Mean	3.64	0.05	2.54	0.15	0.13	6.94	66.7	3.08	—	—	17.2	—
	Median	3.44	0.05	2.36	0.17	0.12	6.37	62.6	2.97	—	—	15.7	—
	Minimum	1.97	-0.02	1.56	0.023	-0.01	2.89	58	2.6	—	—	12.4	—
	Maximum	5.14	0.1	4.37	0.24	0.27	9.8	87.8	4	—	—	24.5	—
	Std. dev.	0.893	0.036	0.717	0.074	0.076	1.917	10.89	0.447	—	—	3.525	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0
M752.8Z	Mean	2.62	0.04	1.38	0.14	0.088	5.43	49.2	2.35	—	—	11.5	—
	Median	2.77	0.03	1.33	0.15	0.057	5.34	45.5	2.3	—	—	11.1	—
	Minimum	1.24	-0.02	0.25	0.023	0.03	2.85	37.3	2.1	—	—	3.41	—
	Maximum	3.46	0.09	2.38	0.21	0.2	7.99	64.8	2.7	—	—	18.7	—
	Std. dev.	0.521	0.03	0.455	0.064	0.05	1.325	10.84	0.212	—	—	3.94	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0
M753.1X	Mean	3.78	0.05	2.6	0.14	0.13	6.94	71.2	3.11	—	—	17.8	—
	Median	3.67	0.04	2.39	0.15	0.1	6.43	65.9	3	—	—	15.9	—
	Minimum	2.37	-0.02	1.65	0.024	-0.01	2.92	60	2.6	—	—	12.4	—
	Maximum	5.3	0.1	4.64	0.23	0.27	10.2	87.8	4.04	—	—	28.3	—
	Std. dev.	0.693	0.038	0.731	0.066	0.074	1.877	11.33	0.461	—	—	4.417	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0
M757.2Z	Mean	2.5	0.04	1.17	0.12	0.081	5.13	46.9	2.15	—	—	11.2	—
	Median	2.64	0.04	1.12	0.13	0.06	4.99	38.4	2.1	—	—	11.1	—
	Minimum	0.66	-0.02	0.25	0.019	0.024	3.01	35.1	1.5	—	—	2.86	—
	Maximum	4.44	0.08	2.29	0.18	0.21	8.55	66	3.08	—	—	26.3	—
	Std. dev.	0.923	0.024	0.572	0.053	0.054	1.55	12.48	0.454	—	—	5.692	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1993 Near-surface measurements:							
M764.3A	Mean	3.76	0.06	2.62	0.14	0.13	6.96	73.6	3.14	—	—	17.2	—
	Median	3.68	0.05	2.43	0.14	0.11	6.49	66.6	3.03	—	—	16.8	—
	Minimum	2.65	-0.02	1.67	0.023	-0.01	2.55	58.8	2.6	—	—	12.1	—
	Maximum	5.11	0.1	4.7	0.23	0.27	10.1	92	4	—	—	23.2	—
	Std. dev.	0.6	0.041	0.739	0.065	0.072	1.904	13.41	0.41	—	—	3.494	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0
M766.0I	Mean	3.65	0.08	2.41	0.15	0.13	7.06	70.6	3.05	—	—	33.3	—
	Median	3.59	0.07	2.46	0.14	0.11	7.5	68	2.9	—	—	16.6	—
	Minimum	2.71	-0.02	-0.01	0.023	0.01	3.21	58.5	2.6	—	—	11.8	—
	Maximum	4.62	0.2	3.71	0.24	0.27	9.95	93.4	3.88	—	—	226	—
	Std. dev.	0.448	0.052	0.853	0.064	0.071	1.686	10.55	0.373	—	—	58.11	—
	N obs.	17	20	20	17	19	20	8	13	0	0	13	0
M771.2P	Mean	3.73	0.07	2.37	0.15	0.12	6.88	72.9	3.28	—	—	18.4	—
	Median	3.7	0.07	2.33	0.16	0.1	6.39	64.4	3.1	—	—	16	—
	Minimum	2.65	-0.02	0.41	0.024	0.016	3.41	56.9	2.85	—	—	12.7	—
	Maximum	4.72	0.1	3.6	0.23	0.25	9.77	94.2	4	—	—	34.6	—
	Std. dev.	0.58	0.034	0.688	0.067	0.069	1.674	16.56	0.435	—	—	5.575	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0
M775.6Q	Mean	4.04	0.09	2.58	0.16	0.12	7.05	65.2	3.2	—	—	24.1	—
	Median	3.95	0.07	2.52	0.17	0.1	7	64.7	3	—	—	16.5	—
	Minimum	3.05	-0.02	0.16	0.018	0.016	3.67	52	2.7	—	—	12.8	—
	Maximum	5.96	0.2	3.86	0.24	0.24	9.99	82.8	4.5	—	—	105	—
	Std. dev.	0.776	0.062	0.805	0.065	0.058	1.575	9.09	0.515	—	—	23.39	—
	N obs.	19	22	22	19	22	22	10	15	0	0	14	0
M781.2O	Mean	3.88	0.09	3.26	0.16	0.11	6.94	65.1	3.19	—	—	17.5	—
	Median	3.7	0.08	2.4	0.18	0.089	6.9	63.8	3.01	—	—	16.2	—
	Minimum	2.88	-0.02	1.63	0.024	0.039	3.86	47.2	2.4	—	—	4.93	—
	Maximum	5.27	0.3	17.6	0.27	0.21	9.17	101	4.2	—	—	31.2	—
	Std. dev.	0.617	0.072	3.251	0.069	0.05	1.376	13.94	0.522	—	—	6.066	—
	N obs.	19	22	22	19	22	21	10	15	0	0	14	0
M786.2C	Mean	3.97	0.07	2.64	0.17	0.12	6.9	68.8	3.26	—	—	18.5	—
	Median	3.79	0.06	2.57	0.2	0.087	6.63	65.8	3.12	—	—	17.1	—
	Minimum	3.04	-0.02	0.8	0.026	0.052	4.32	61.6	2.79	—	—	13.4	—
	Maximum	5.54	0.2	3.88	0.27	0.23	9.39	78.5	4.12	—	—	27.7	—
	Std. dev.	0.71	0.042	0.765	0.081	0.06	1.558	6.714	0.397	—	—	4.276	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1993 Near-surface measurements:							
M786.5D	Mean	3.71	0.07	2.47	0.16	0.11	6.81	73.4	3.17	—	—	17.5	—
	Median	3.73	0.07	2.37	0.14	0.09	6.31	69.4	3.06	—	—	15.5	—
	Minimum	2.5	-0.02	0.53	0.025	0.043	4.43	61.8	2.8	—	—	12.4	—
	Maximum	4.99	0.2	3.42	0.29	0.2	9.06	99.5	4.04	—	—	30.6	—
	Std. dev.	0.608	0.053	0.722	0.078	0.055	1.415	13.43	0.397	—	—	4.825	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0
M796.9M	Mean	4.07	0.06	2.68	0.17	0.12	7	70.9	3.32	—	—	19	—
	Median	4.01	0.06	2.64	0.19	0.095	6.36	66	3.24	—	—	18.7	—
	Minimum	3.05	-0.02	0.94	0.027	0.034	4.25	60.8	2.85	—	—	13.7	—
	Maximum	5.97	0.2	3.94	0.27	0.22	9.56	88.1	4.2	—	—	25.8	—
	Std. dev.	0.704	0.047	0.852	0.079	0.062	1.647	10.42	0.436	—	—	3.714	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0
M796.9N	Mean	3.8	0.1	2.48	0.17	0.11	6.87	65.8	3.13	—	—	18.8	—
	Median	3.65	0.07	2.42	0.14	0.1	6.87	62.9	2.94	—	—	16.9	—
	Minimum	2.5	-0.02	0.43	0.026	0.048	4.44	48.4	2.7	—	—	11.3	—
	Maximum	5.56	0.3	3.5	0.44	0.2	8.86	104	4.12	—	—	32.6	—
	Std. dev.	0.86	0.079	0.727	0.096	0.047	1.3	15.06	0.432	—	—	5.692	—
	N obs.	18	21	21	19	21	22	10	15	0	0	14	0
VM00.1M	Mean	4.11	0.06	3.19	0.19	0.13	7.16	68	2.89	—	—	19.9	—
	Median	4.22	0.05	3.06	0.22	0.11	7.06	67.3	2.62	—	—	16.3	—
	Minimum	3.17	-0.02	1.97	0.025	0.021	3.27	50.9	1.8	—	—	6.02	—
	Maximum	4.77	0.2	5.13	0.28	0.27	10.5	85.4	4.5	—	—	32.7	—
	Std. dev.	0.462	0.052	0.752	0.078	0.072	1.834	11.03	0.871	—	—	7.693	—
	N obs.	18	22	22	19	22	22	10	15	0	0	14	0
WW01.3M	Mean	5.16	0.04	4.74	0.19	0.1	6.69	86.6	1.77	—	—	13	—
	Median	5.12	0.03	4.79	0.11	0.077	6.83	79.5	1.7	—	—	13	—
	Minimum	3.68	-0.02	3.79	0.022	0.038	5.28	72.8	1.37	—	—	10.7	—
	Maximum	6.41	0.08	5.66	0.89	0.27	7.94	100	2.4	—	—	16.4	—
	Std. dev.	0.793	0.027	0.494	0.207	0.061	0.726	12.5	0.308	—	—	1.431	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0
ZM00.1M	Mean	5.76	0.02	5.46	0.19	0.077	5.64	86.9	1.98	—	—	19.4	—
	Median	5.64	-0.02	5.37	0.081	0.07	5.63	89	1.79	—	—	18.9	—
	Minimum	4.18	-0.02	4.11	0.013	0.017	4.18	76.1	1.6	—	—	-0.01	—
	Maximum	7.58	0.06	7.61	0.91	0.15	7.25	100	3	—	—	48.3	—
	Std. dev.	1.048	0.017	0.978	0.23	0.049	0.945	10.51	0.451	—	—	10.51	—
	N obs.	16	17	17	16	17	17	5	10	0	0	13	0

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1993 Near-bottom measurements:							
M764.3A	Mean	3.88	0.07	2.64	0.15	0.13	7.07	70.7	3.15	—	—	18.7	—
	Median	3.74	0.06	2.48	0.16	0.11	6.52	66	3	—	—	16.3	—
	Minimum	2.41	-0.02	1.66	0.024	-0.01	2.96	59.3	2.7	—	—	12.1	—
	Maximum	5.92	0.2	4.91	0.25	0.27	10.2	94.4	4.02	—	—	39.7	—
	Std. dev.	0.831	0.044	0.762	0.069	0.074	1.835	12.35	0.408	—	—	7	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0
M766.0I	Mean	3.63	0.08	2.49	0.15	0.13	7.08	72.1	3.05	—	—	16.6	—
	Median	3.49	0.07	2.49	0.16	0.11	6.69	69.3	2.87	—	—	15.7	—
	Minimum	2.67	-0.02	0.41	0.023	0.015	3.11	59.5	2.6	—	—	11.6	—
	Maximum	4.93	0.2	3.9	0.25	0.27	9.99	92.6	3.86	—	—	23.5	—
	Std. dev.	0.568	0.051	0.736	0.07	0.07	1.678	10.96	0.392	—	—	3.389	—
	N obs.	17	20	20	17	20	20	8	13	0	0	13	0
M771.2P	Mean	3.83	0.08	2.5	0.18	0.13	7.06	69.3	3.16	—	—	17.5	—
	Median	3.77	0.07	2.41	0.16	0.1	6.47	65.6	3.02	—	—	15.7	—
	Minimum	2.85	-0.02	0.44	0.024	0.024	3.72	57.8	2.78	—	—	12.5	—
	Maximum	5.51	0.2	4.67	0.32	0.33	9.85	94.6	4.04	—	—	25.5	—
	Std. dev.	0.707	0.052	0.905	0.09	0.08	1.722	13.38	0.391	—	—	3.752	—
	N obs.	16	18	18	16	18	18	6	11	0	0	14	0
M775.6Q	Mean	3.96	0.1	2.55	0.17	0.12	7	67	3.2	—	—	18	—
	Median	3.76	0.08	2.45	0.18	0.11	6.86	66.8	3	—	—	16.1	—
	Minimum	3.15	-0.02	0.16	0.023	0.022	3.96	51.4	2.1	—	—	12.7	—
	Maximum	5.73	0.3	3.86	0.26	0.24	9.52	98.8	4.8	—	—	28.8	—
	Std. dev.	0.617	0.067	0.813	0.071	0.059	1.442	13.23	0.619	—	—	4.656	—
	N obs.	19	22	22	19	22	22	10	15	0	0	14	0
M781.2O	Mean	3.78	0.09	2.49	0.17	0.12	6.9	65.7	3.24	—	—	18	—
	Median	3.77	0.08	2.37	0.19	0.098	6.9	64.3	3	—	—	16.8	—
	Minimum	2.47	-0.02	0.58	0.027	0.035	3.67	50.4	2.7	—	—	12.4	—
	Maximum	5.07	0.2	3.66	0.29	0.23	9.46	81.9	4.66	—	—	29.5	—
	Std. dev.	0.643	0.058	0.694	0.075	0.055	1.507	8.828	0.579	—	—	4.516	—
	N obs.	18	22	22	19	22	22	10	15	0	0	14	0

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1994 Near-surface measurements:							
CH00.1M	Mean	1.36	0.06	0.69	0.14	0.037	4.87	20.4	1.66	7.93	4.83	5.93	10.3
	Median	1.25	0.03	0.63	0.093	0.04	4.95	16.5	1.41	6.67	3.45	4.96	5.42
	Minimum	0.72	-0.02	-0.01	-0.01	-0.01	2.02	9.84	0.93	3.52	1.55	2.3	1.23
	Maximum	2.67	0.3	1.35	0.93	0.094	7.67	84.6	3.12	29.5	18.4	14.6	57.4
	Std. dev.	0.484	0.081	0.319	0.189	0.021	1.576	16.61	0.632	5.646	4.087	3.073	15.46
	N obs.	23	23	23	23	23	23	23	23	23	23	23	21
CN00.1M	Mean	4.01	0.08	3.41	0.18	0.045	7.06	69.2	3.25	24.7	10.1	19.5	37.9
	Median	3.68	-0.02	3.46	0.15	0.035	7.71	67.5	3.3	24.5	9.38	18	27.6
	Minimum	2.66	-0.02	1.73	0.07	-0.01	0.84	39.1	2.34	15.4	6.08	13.7	19.5
	Maximum	5.71	0.4	5.04	0.53	0.16	9.95	96	5.37	33.6	21.6	30.6	165
	Std. dev.	0.901	0.118	1.085	0.109	0.037	2.584	11.26	0.716	4.017	3.363	5.061	31.85
	N obs.	24	24	24	24	24	23	24	24	24	24	24	21
M738.2F	Mean	2.32	0.07	1.98	0.14	0.048	5.63	55	2.85	21.8	12.1	15	44.7
	Median	2.33	0.02	1.94	0.12	0.036	6.11	53.4	2.77	20.7	11.2	12.9	41.6
	Minimum	-0.1	-0.02	1.11	0.056	-0.01	0.11	45.2	1.92	17.6	8.08	4.97	22.5
	Maximum	3.05	0.4	3	0.4	0.14	8.04	95.8	4.68	32.3	25.6	33.8	66.9
	Std. dev.	0.647	0.096	0.538	0.075	0.037	2.065	9.903	0.553	3.441	3.641	5.816	12.87
	N obs.	24	24	23	23	24	24	24	24	24	24	24	21
M742.6B	Mean	2.42	0.05	1.91	0.14	0.026	5.42	55.1	2.49	22.3	10.5	13.3	36.5
	Median	2.35	0.03	1.82	0.14	0.018	5.74	55.1	2.52	22.2	9.94	12.8	34.1
	Minimum	1.64	-0.02	0.81	0.078	-0.01	0.74	43	1.77	14.9	5.34	7.22	19.6
	Maximum	3.08	0.3	3.09	0.24	0.085	8.39	73.1	3.36	28.1	23	21.3	63.3
	Std. dev.	0.415	0.071	0.649	0.046	0.02	1.806	6.628	0.407	3.261	3.35	3.403	10.8
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21
M742.8D	Mean	2.42	0.07	1.85	0.14	0.034	5.57	55.4	2.69	22.2	12	15.1	51.8
	Median	2.44	0.02	1.75	0.12	0.028	6.14	55.2	2.68	21.4	10.9	13.5	44.4
	Minimum	1.57	-0.02	0.69	0.067	-0.01	1.31	46.1	1.47	18.9	8.67	6.35	23.5
	Maximum	3.3	0.3	3.08	0.28	0.11	8.05	71.5	4.11	27.7	24.9	35.6	186
	Std. dev.	0.483	0.08	0.664	0.063	0.026	1.788	5.803	0.579	2.647	3.515	5.465	33.12
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21
M745.2L	Mean	2.43	0.09	2.05	0.14	0.045	5.94	53.4	2.83	21.2	12	15.5	49.2
	Median	2.4	0.03	1.92	0.12	0.034	6.41	53	2.76	20.6	11.2	13.5	47.4
	Minimum	1.41	-0.02	1.13	0.054	-0.01	1.97	40.2	1.95	15	6.87	8.22	25.6
	Maximum	3.45	0.4	3.33	0.27	0.12	8.05	65.4	3.75	26.7	25.2	34	82.7
	Std. dev.	0.459	0.112	0.583	0.056	0.032	1.55	5.717	0.434	2.886	3.584	5.494	16.38
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1994 Near-surface measurements:							
M746.9Y	Mean	2.1	0.08	1.63	0.13	0.056	5.82	45.1	2.63	18.1	10.3	12.7	38.4
	Median	2.09	-0.02	1.66	0.11	0.046	6.19	43.6	2.58	17.1	9.32	11.1	37.7
	Minimum	1.35	-0.02	0.88	0.045	-0.01	2.29	29.8	1.59	11.8	6.42	6.15	22.5
	Maximum	2.93	0.4	2.45	0.31	0.15	7.38	59.7	4.8	24.5	23.1	22.7	66
	Std. dev.	0.37	0.101	0.431	0.06	0.041	1.5	7.701	0.635	3.557	3.621	4.292	11.69
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21
M747.3R	Mean	2.66	0.09	2.13	0.13	0.073	5.92	55.7	2.94	21.9	12.6	15.2	45.4
	Median	2.59	0.02	2.1	0.12	0.053	6.49	54.5	2.82	20.9	11.6	14.1	40.5
	Minimum	1.85	-0.02	1.22	0.051	-0.01	2.1	31.4	1.98	12.7	7.13	4.13	16.4
	Maximum	3.58	0.4	3.44	0.24	0.4	7.89	75	4.92	29.5	26.3	34.1	77.2
	Std. dev.	0.422	0.1	0.598	0.057	0.083	1.657	8.983	0.652	3.849	4.019	6.242	17.83
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21
M752.8Y	Mean	2.47	0.1	2.02	0.14	0.053	6.14	54.4	2.95	21.9	12.6	16.1	54.4
	Median	2.46	0.04	1.86	0.12	0.039	6.57	53.2	2.88	20.7	11.4	14.1	49
	Minimum	1.4	-0.02	0.94	0.052	-0.01	2	46.9	2.04	19.1	9.23	8.85	32.4
	Maximum	3.37	0.5	3.98	0.23	0.12	8.3	74.1	4.47	29.2	26.2	32.5	90
	Std. dev.	0.524	0.126	0.682	0.048	0.034	1.61	5.828	0.559	3.147	3.772	5.103	16.82
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21
M752.8Z	Mean	1.88	0.07	1.37	0.12	0.045	5.58	40.4	2.52	16.6	9.39	12.5	32.1
	Median	1.86	0.03	1.26	0.12	0.04	5.88	40.2	2.46	16.5	7.98	10.4	31.4
	Minimum	1.36	-0.02	0.14	0.048	-0.01	2.04	20.7	1.47	8.17	5.07	3.47	6.09
	Maximum	2.53	0.4	2.55	0.22	0.11	7.24	60.3	3.51	23.6	23.8	39.5	60.7
	Std. dev.	0.287	0.094	0.504	0.042	0.029	1.481	9.517	0.453	4.227	4.189	7.353	13.06
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21
M753.1X	Mean	2.43	0.1	1.89	0.13	0.054	6.21	56	3.1	22.4	13.2	15.8	57.6
	Median	2.31	0.03	1.81	0.12	0.04	6.82	55.2	3.03	21.6	12.4	13.8	51.1
	Minimum	1.77	-0.02	-0.01	0.046	-0.01	1.78	47	2.19	18.1	8.5	8.8	36.8
	Maximum	3.26	0.4	3.51	0.24	0.17	8.12	72.7	4.92	28.3	27.6	33.4	152
	Std. dev.	0.482	0.13	0.733	0.051	0.042	1.741	5.665	0.562	2.974	4.096	5.357	26.04
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21
M757.2Z	Mean	2.7	0.07	1.22	0.12	0.038	5.42	37.1	2.37	15.1	8.6	11.5	30.8
	Median	1.87	0.03	1.26	0.11	0.03	5.77	36.3	2.28	15.2	8.26	9.59	30.2
	Minimum	1.27	-0.02	-0.01	0.05	-0.01	2.04	19.6	1.53	7.54	4.69	5.12	14.1
	Maximum	23	0.3	2.13	0.21	0.09	7.29	61.9	5.04	24.8	19.7	23.8	64.3
	Std. dev.	4.338	0.085	0.469	0.045	0.023	1.439	8.804	0.67	3.969	3.425	4.791	12.25
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1994 Near-surface measurements:							
M764.3A	Mean	2.59	0.09	1.94	0.14	0.058	6.21	57.1	3.06	22.8	13.2	16	55
	Median	2.62	0.04	1.83	0.14	0.049	6.9	56.5	3.06	22.1	12.7	14.3	53.1
	Minimum	1.66	-0.02	-0.01	0.036	-0.01	1.58	47.6	2.25	18.7	8.06	6.02	29.6
	Maximum	3.49	0.4	3.53	0.25	0.16	8.28	71	4.05	28.8	21.5	35.3	89
	Std. dev.	0.506	0.12	0.755	0.055	0.042	1.789	6.09	0.439	3.019	3.631	6.4	15.64
	N obs.	23	23	23	23	23	23	23	23	23	23	23	21
M766.0I	Mean	2.45	0.1	1.88	0.14	0.06	6.26	57.6	3.19	23	13.8	16.5	61.7
	Median	2.32	0.04	1.81	0.12	0.055	6.77	56.1	3.09	21.7	12.1	14.7	51.9
	Minimum	1.61	-0.02	-0.01	0.051	0.011	1.25	44.6	2.13	17.6	8.55	6.51	27
	Maximum	3.79	0.5	3.68	0.28	0.14	8.07	83.3	4.53	32	29.4	38.9	147
	Std. dev.	0.559	0.123	0.779	0.061	0.038	1.855	8.072	0.556	3.576	4.765	7.287	29.19
	N obs.	24	24	24	24	24	23	24	24	24	24	24	21
M771.2P	Mean	2.69	0.1	2.03	0.14	0.05	6.19	57.4	3.12	23.2	14.6	17.8	66.7
	Median	2.51	0.05	1.84	0.13	0.037	6.61	57	2.94	22.2	12.5	14.3	58.9
	Minimum	1.65	-0.02	0.99	0.069	-0.01	1.84	46.6	2.37	18.1	9.12	5.71	33.9
	Maximum	5.11	0.4	3.69	0.23	0.12	8.39	72.4	4.65	30.4	36.3	45.9	214
	Std. dev.	0.744	0.112	0.701	0.047	0.036	1.809	6.455	0.522	3.286	6.331	8.655	38.47
	N obs.	24	24	24	24	24	23	24	24	24	24	24	21
M775.6Q	Mean	2.59	0.1	2.06	0.14	0.055	6.16	56.6	3.13	22.8	14.3	16.6	66.4
	Median	2.38	0.07	1.83	0.12	0.036	6.57	55.3	3.06	22	12.4	15	58.1
	Minimum	1.67	-0.02	1.03	0.062	-0.01	1.98	46.6	2.31	17.6	9.11	11.1	30.4
	Maximum	4.3	0.4	3.71	0.26	0.17	8.2	71.2	4.62	30.2	28	28.9	246
	Std. dev.	0.646	0.12	0.681	0.054	0.048	1.675	6.616	0.552	3.314	4.975	4.845	44.26
	N obs.	24	24	24	24	24	24	23	23	23	23	24	21
M781.2O	Mean	2.52	0.1	2.02	0.15	0.048	6.01	56.8	3.08	22.9	14	16	56.5
	Median	2.39	0.06	1.93	0.12	0.033	6.5	55.7	2.88	21.9	12.3	14.5	52.7
	Minimum	1.69	-0.02	0.98	0.087	-0.01	1.82	45.5	2.16	17.2	8.55	7.2	36
	Maximum	4.26	0.4	3.59	0.24	0.12	8.18	70.2	4.56	29.5	28.6	26.7	86.9
	Std. dev.	0.583	0.109	0.718	0.051	0.036	1.735	5.91	0.557	3.242	4.417	4.839	14.48
	N obs.	24	23	23	24	24	24	24	24	24	24	24	21
M786.2C	Mean	2.73	0.1	2.48	0.17	0.047	5.93	56.6	3.09	23	14.4	16.8	65.3
	Median	2.7	0.04	2.15	0.14	0.037	6.36	57.6	3.02	23.1	13.3	14.7	63.1
	Minimum	1.83	-0.02	1.17	0.064	-0.01	1.07	22.5	1.47	7.63	6.83	11.1	37.2
	Maximum	3.99	0.4	7.35	0.43	0.13	7.52	69.6	4.47	29.8	29.4	33.4	176
	Std. dev.	0.594	0.119	1.199	0.078	0.039	1.739	9.255	0.683	4.564	4.627	5.639	29.79
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
1994 Near-surface measurements:													
M786.5D	Mean	2.58	0.08	1.95	0.16	0.038	5.67	55.5	2.94	22.4	12.3	15.8	58.1
	Median	2.43	0.04	1.97	0.14	0.028	6.2	53.1	3	21.1	11.8	13.7	59.4
	Minimum	1.65	-0.02	-0.01	0.066	-0.01	1.78	45.3	1.47	18	5.24	7.91	33.8
	Maximum	3.58	0.3	3.1	0.29	0.13	7.6	76.3	4.8	29.1	17.9	30	96
	Std. dev.	0.529	0.101	0.658	0.063	0.036	1.681	7.136	0.717	3.244	3.11	5.129	16.9
	N obs.	22	22	22	22	22	22	22	22	22	22	22	21
M796.9M	Mean	2.82	0.1	2.16	0.17	0.047	5.99	57.6	3.18	23.3	14.3	16.2	58.6
	Median	2.73	0.05	2.02	0.16	0.032	6.53	58.4	3.2	22.6	13	14.7	55.5
	Minimum	1.82	-0.02	1.17	0.073	-0.01	1.57	40.2	2.28	17.1	8.67	6.1	32
	Maximum	3.89	0.4	3.81	0.33	0.15	7.91	70.6	4.35	30.2	27.8	26.2	108
	Std. dev.	0.661	0.121	0.637	0.069	0.044	1.694	7.348	0.499	3.722	4.05	5.463	20.86
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21
M796.9N	Mean	2.63	0.1	2.02	0.17	0.048	6.16	55.1	2.92	22.1	13.7	16.6	60
	Median	2.52	0.04	1.89	0.14	0.035	6.61	54	2.97	21.9	13	14.2	55.6
	Minimum	1.8	-0.02	1.13	0.064	-0.01	1.71	42.6	1.02	17.8	8.11	10.1	37.2
	Maximum	3.91	0.4	3.32	0.59	0.16	8.12	67.3	4.56	28.5	28.6	30.5	105
	Std. dev.	0.647	0.126	0.563	0.109	0.042	1.586	7.145	0.767	3.105	4.423	5.559	18.21
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21
VM00.1M	Mean	3.13	0.09	2.54	0.19	0.062	6.21	62	2.96	24.3	15.3	20.6	50
	Median	3.14	0.08	2.53	0.16	0.039	6.9	62.6	2.82	24.3	14.4	18.6	39.5
	Minimum	2.17	-0.02	-0.01	0.084	-0.01	0.15	47.9	2.16	17.9	7.88	9.73	21.7
	Maximum	6.18	0.4	4.34	0.46	0.16	8.7	72	4.47	32.1	28.8	34.5	92
	Std. dev.	0.803	0.091	1.055	0.081	0.052	2.307	5.454	0.608	3.229	4.261	6.2	24.18
	N obs.	24	24	24	24	24	24	24	24	24	24	24	20
WW01.3M	Mean	3.67	0.05	3.6	0.13	0.043	6.08	66.6	2	25.1	6.19	10.6	13.5
	Median	3.66	0.03	3.85	0.089	0.017	6.27	66.6	1.71	25.5	5.6	10.1	14.1
	Minimum	2.84	-0.02	1.43	0.036	-0.01	3.53	48.7	1.17	14.7	2.28	4.56	5.62
	Maximum	5.29	0.4	4.5	0.78	0.52	7.95	78.6	4.92	29.5	15.5	16.7	23.1
	Std. dev.	0.529	0.08	0.761	0.152	0.105	1.095	7.02	0.924	3.018	2.692	2.781	4.002
	N obs.	23	24	24	23	23	24	24	24	24	24	24	21
ZM00.1M	Mean	4.08	0.03	3.98	0.14	0.027	5.07	64.6	2.3	23.2	10.8	21.9	28.4
	Median	4.02	-0.02	3.86	0.11	0.013	4.94	66	2.1	24.3	9.73	18.4	21
	Minimum	2.53	-0.02	1.86	0.024	-0.01	2.78	34.3	1.41	13.8	6.02	9.6	10.6
	Maximum	6.17	0.3	5.9	0.31	0.18	7.35	78.6	4.77	28.8	21.6	98.9	195
	Std. dev.	0.93	0.067	1.172	0.093	0.039	1.132	10.85	0.842	3.615	3.933	17.52	38.38
	N obs.	22	22	22	22	22	22	22	22	22	22	22	21

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1994 Near-bottom measurements:							
M764.3A	Mean	2.47	0.1	2	0.14	0.056	6.18	57.3	3.02	23.1	13.8	16.8	57.7
	Median	2.53	0.04	1.85	0.12	0.049	6.8	56.2	3.03	22	12.8	14.8	54.7
	Minimum	1.52	-0.02	1.09	0.052	-0.01	1.79	48.5	2.07	19.4	8.03	10.5	29.4
	Maximum	3.6	0.4	3.51	0.29	0.12	8.25	67.3	4.2	29.8	31.7	45.6	107
	Std. dev.	0.528	0.112	0.651	0.062	0.036	1.803	5.012	0.495	3.186	4.969	7.579	18.58
	N obs.	23	23	23	23	23	23	22	23	23	23	23	21
M766.0I	Mean	2.55	0.1	1.97	0.15	0.056	6.09	57.2	3.01	23	14	16.1	53
	Median	2.46	0.05	1.88	0.13	0.046	6.74	57.4	3	22.4	13.6	14.3	52.1
	Minimum	1.54	-0.02	-0.01	0.073	-0.01	0.17	46.3	1.74	18.1	8.96	7.23	30
	Maximum	3.57	0.4	3.46	0.3	0.13	8.66	75.8	4.17	29.3	24.4	36.3	88.5
	Std. dev.	0.511	0.107	0.805	0.058	0.034	2.115	6.783	0.553	3.041	4.065	6.413	16.41
	N obs.	24	24	24	24	24	24	24	24	24	24	24	21
M771.2P	Mean	2.63	0.1	1.96	0.16	0.057	6.24	55.7	3.06	22.3	13.8	18.8	57.9
	Median	2.44	0.09	1.88	0.16	0.047	6.54	56.4	2.97	21.9	12	14.6	55.4
	Minimum	1.93	-0.02	-0.01	0.067	-0.01	3.38	15.9	2.13	5.15	3.72	9.78	31.5
	Maximum	4.24	0.4	3.47	0.26	0.12	8.55	72.6	4.2	28.6	33.1	64.1	102
	Std. dev.	0.55	0.112	0.771	0.053	0.036	1.43	10.36	0.518	4.605	6.22	11.61	18.03
	N obs.	23	24	24	23	24	24	24	24	24	24	24	21
M775.6Q	Mean	2.6	0.1	1.96	0.17	0.05	6.4	55.3	3.16	22.9	13.9	16.3	62.2
	Median	2.39	0.09	1.75	0.16	0.04	7.18	56.9	3.09	22.2	12.2	14.6	50
	Minimum	1.89	-0.02	1.02	0.064	-0.01	2.66	0.59	2.07	17.7	9.04	6.58	28.7
	Maximum	4.02	0.4	3.23	0.37	0.13	8.35	73.6	4.98	30.6	27.9	29.9	189
	Std. dev.	0.59	0.119	0.606	0.074	0.039	1.643	13.33	0.615	3.186	4.846	5.247	34.74
	N obs.	24	24	24	24	24	23	24	24	24	24	24	21
M781.2O	Mean	2.59	0.1	2	0.16	0.048	6.22	57.4	3.06	23	13.7	16.5	65
	Median	2.53	0.06	1.94	0.18	0.035	6.85	56.3	3	22.4	12.5	15.4	57.7
	Minimum	1.75	-0.02	0.86	0.076	-0.01	2.38	47.1	2.28	18.2	8.9	9.9	35.3
	Maximum	4.29	0.3	3.58	0.26	0.14	8.15	70.9	4.08	29.7	28.1	26.1	164
	Std. dev.	0.573	0.098	0.692	0.057	0.038	1.613	5.854	0.417	2.968	4.076	4.716	27.58
	N obs.	23	23	23	23	23	23	23	23	23	23	23	20

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1995 Near-surface measurements:							
CH00.1M	Mean	1.45	0.06	0.66	0.089	0.033	5.2	18.3	2.01	7.27	4.39	5.24	5.55
	Median	1.35	0.03	0.63	0.069	0.027	5.58	16.4	1.68	6.52	3.57	5.27	5.64
	Minimum	0.74	-0.02	0.19	0.03	-0.01	1.99	11.1	1.02	4.28	1.04	1.22	1.55
	Maximum	2.54	0.3	1.25	0.2	0.13	6.98	73.7	6.3	29	20.4	8.07	8.13
	Std. dev.	0.415	0.066	0.338	0.049	0.025	1.273	11.98	1.238	4.773	3.52	1.434	1.274
	N obs.	24	25	25	24	25	25	25	25	25	25	25	25
CN00.1M	Mean	4.52	0.06	3.89	0.15	0.032	6.88	77.7	3.61	28.7	12.2	22.9	36.5
	Median	4.45	0.04	4.18	0.14	0.028	6.94	76.8	3.54	29.1	11.8	22.7	32
	Minimum	2.85	-0.02	2.03	0.037	-0.01	2.12	51.9	2.25	20.6	7.08	17.2	23.6
	Maximum	7.1	0.2	5.26	0.43	0.092	12.1	105	7.47	36.8	17.5	30.5	121
	Std. dev.	1.03	0.047	1.034	0.083	0.023	2.704	10.85	1.152	3.985	2.688	3.645	20.01
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
M738.2F	Mean	3.64	0.07	2.07	0.12	0.042	6.18	57.5	3.35	23.8	12.9	17	54.2
	Median	2.84	0.05	1.99	0.11	0.028	6.5	60.6	3.27	24.3	13	15.1	60.7
	Minimum	1.62	-0.02	0.65	0.045	-0.01	2.18	38.6	2.04	15.3	7.3	9.55	21.6
	Maximum	19	0.2	3.92	0.31	0.13	9.47	69.9	7.29	31.5	19.4	44.5	95
	Std. dev.	3.291	0.045	0.795	0.064	0.033	1.758	9.174	1.121	4.576	2.921	6.714	20.61
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
M742.6B	Mean	2.97	0.04	2.92	0.13	0.023	5.78	60.2	2.87	25	11.3	14	40.3
	Median	2.94	0.03	2.25	0.12	0.011	5.82	61	2.82	24.9	10.7	14.2	35.6
	Minimum	1.85	-0.02	0.68	0.028	-0.01	1.32	38.2	1.38	16	6.56	8.68	22.3
	Maximum	4.33	0.1	19.4	0.27	0.079	9.31	82	6.15	32.3	15.7	19.8	76
	Std. dev.	0.648	0.026	3.7	0.066	0.022	1.843	10.03	0.992	4.793	2.997	2.825	17.2
	N obs.	24	23	23	24	24	24	24	24	24	24	24	24
M742.8D	Mean	2.94	0.05	2.05	0.12	0.035	6.03	58.6	3.39	24.2	12.9	16.1	51.5
	Median	2.84	0.03	1.86	0.11	0.016	6.33	60.8	2.91	24.9	12.7	15.5	48.3
	Minimum	1.92	-0.02	0.63	0.036	-0.01	2.21	40.9	1.32	15.3	7.12	7.84	22.1
	Maximum	4.4	0.2	4.07	0.24	0.11	9.71	72.8	13.8	31.9	19.8	27.8	99.5
	Std. dev.	0.656	0.043	0.813	0.059	0.032	1.781	9.729	2.362	4.668	3.163	4.119	21.36
	N obs.	23	24	24	23	24	24	24	24	24	24	24	24
M745.2L	Mean	3.16	0.06	2.26	0.12	0.043	6.35	58.8	3.27	24	13.3	16.3	52.3
	Median	2.73	0.04	2.08	0.1	0.03	6.11	61.5	2.79	23.7	12.8	15.1	38.4
	Minimum	1.57	-0.02	0.68	0.04	-0.01	2.41	38.1	2.25	15.9	7.6	8.06	22.4
	Maximum	7.79	0.2	4.22	0.29	0.11	9.45	72.6	6.33	31.8	20.1	29.8	97.6
	Std. dev.	1.264	0.049	0.923	0.055	0.029	1.655	9.787	1.049	4.692	3.205	4.522	22.22
	N obs.	23	23	23	23	24	24	24	24	24	24	24	24

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1995 Near-surface measurements:							
M746.9Y	Mean	2.53	0.06	1.68	0.12	0.041	6.09	48	3.1	19.9	11.1	12.2	35.3
	Median	2.37	0.04	1.66	0.1	0.031	6.3	45.8	2.76	18.5	10.7	11.3	30.3
	Minimum	1.77	-0.02	-0.01	0.049	-0.01	2.36	29.1	2.16	11	4.87	4.83	17.9
	Maximum	4.14	0.3	3	0.45	0.097	8.6	66.3	6	29.1	19.7	22.8	63.4
	Std. dev.	0.633	0.065	0.722	0.082	0.026	1.601	11.35	0.981	5.277	3.71	5.012	14.28
	N obs.	23	24	24	23	24	24	24	24	24	24	24	24
M747.3R	Mean	3.07	0.06	2.38	0.11	0.044	6.41	59.3	3.21	24.2	13.2	16.2	51.7
	Median	2.91	0.04	2.22	0.1	0.031	6.62	60.9	2.88	23.7	13.4	15.7	50.1
	Minimum	1.43	-0.02	0.7	0.039	-0.01	2.36	34.1	2.25	14.2	7.67	10.3	22.7
	Maximum	4.83	0.2	4.51	0.2	0.12	9.63	73.5	6.9	32.1	20.8	30	96.9
	Std. dev.	0.833	0.048	0.96	0.049	0.033	1.703	10.03	0.98	4.768	3.324	4.347	21.02
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
M752.8Y	Mean	2.95	0.07	2.23	0.12	0.047	6.53	60.8	3.41	25.3	13.9	17.8	57.8
	Median	2.72	0.04	2.19	0.099	0.034	6.6	64.3	3.06	24.9	13.5	15.3	52.1
	Minimum	1.62	-0.02	0.65	0.045	-0.01	2.09	42.2	2.46	14.8	7.26	11	26.3
	Maximum	4.35	0.2	4.2	0.21	0.12	9.82	76.8	7.29	36.2	22.8	37.6	113
	Std. dev.	0.823	0.054	0.897	0.046	0.032	1.872	9.968	1.056	5.354	3.844	6.396	24.68
	N obs.	23	24	24	23	24	24	24	24	24	24	24	24
M752.8Z	Mean	2.19	0.07	1.4	0.12	0.039	5.82	41.6	2.81	17.2	9.86	11.4	32.3
	Median	2.13	0.05	1.25	0.1	0.03	5.95	37.3	2.52	16.5	9.27	9.36	30.5
	Minimum	1.49	-0.02	0.57	0.045	-0.01	2.42	23.7	1.65	9.13	4.34	6.12	11.5
	Maximum	3.85	0.6	2.96	0.25	0.1	8.25	64.8	5.91	28.7	19.6	22.4	68.6
	Std. dev.	0.549	0.107	0.596	0.051	0.026	1.473	11.9	0.936	5.168	4.219	4.736	15.23
	N obs.	23	24	24	23	24	24	24	24	24	24	24	24
M753.1X	Mean	2.94	0.07	2.17	0.12	0.044	6.24	60	3.46	24.8	13.7	16.5	59.9
	Median	3.06	0.06	2.11	0.1	0.036	6.14	63.1	2.82	25.1	13.6	16.2	56.2
	Minimum	1.51	-0.02	0.56	0.038	-0.01	0.19	42.2	2.04	15.3	7.2	11.1	25.5
	Maximum	4.53	0.2	4.07	0.23	0.11	10.3	73.5	8.46	33.4	23.5	29.8	107
	Std. dev.	0.781	0.045	0.88	0.047	0.03	2.253	10.02	1.5	5.085	3.742	3.835	26.14
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
M757.2Z	Mean	2.03	0.06	1.2	0.12	0.04	5.62	37.3	2.9	15.4	8.69	10.8	31.5
	Median	2.03	0.04	1.25	0.09	0.033	6	39.2	2.37	15.8	7.58	8.73	28 6
	Minimum	1.18	-0.02	0.39	0.04	-0.01	2.29	19.7	1.65	7.24	3.79	5.73	9.97
	Maximum	3.61	0.6	1.93	0.48	0.12	7.42	56.3	8.01	25.3	19	22.4	95
	Std. dev.	0.538	0.111	0.499	0.094	0.029	1.345	11.37	1.401	5.029	3.881	4.885	20.18
	N obs.	25	24	24	25	25	25	25	25	25	25	25	25

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1995 Near-surface measurements:							
M764.3A	Mean	4.77	0.07	2.46	0.12	0.044	6.44	62.6	3.39	25.8	14.4	17.1	60.9
	Median	3.17	0.06	2.43	0.1	0.029	6.42	64	3.18	26.6	14.2	15.4	62.3
	Minimum	1.7	0.02	0.57	0.043	-0.01	2.24	45.7	0.78	16.2	6.35	4.54	13.8
	Maximum	23	0.2	6.81	0.23	0.12	10.9	75.8	7.92	33.9	23.4	36.4	97.7
	Std. dev.	5.454	0.047	1.331	0.046	0.035	1.977	9.785	1.231	4.829	4.568	6.696	24.25
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
M766.0I	Mean	2.94	0.06	2.34	0.11	0.043	6.45	60.5	3.41	24.8	14.3	17.8	62.7
	Median	2.99	0.05	2.29	0.099	0.032	6.43	62.7	3.27	25.5	13.7	16.1	71.3
	Minimum	1.55	-0.02	0.52	0.036	-0.01	2.6	44.2	2.55	16.4	7.84	11.2	25
	Maximum	4.99	0.2	4.36	0.21	0.16	9.74	74.2	6.75	32.7	27.3	35.3	104
	Std. dev.	0.86	0.048	1.072	0.042	0.04	1.79	9.246	0.86	4.555	4.404	5.392	24.94
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
M771.2P	Mean	3.02	0.08	2.35	0.13	0.045	6.61	61.4	3.22	25.2	14.3	17.5	63
	Median	2.86	0.07	2.27	0.13	0.034	6.67	63	3.06	26.7	13.7	16.3	63.4
	Minimum	1.62	-0.02	0.49	0.057	-0.01	2.56	44	2.31	16.6	6.99	12.9	28.8
	Maximum	4.83	0.2	4.22	0.35	0.16	10.4	77	5.85	32.3	22.6	26	100
	Std. dev.	0.818	0.062	0.95	0.065	0.038	1.858	10.62	0.815	4.975	4.019	3.86	23.74
	N obs.	25	25	24	25	25	25	25	25	25	25	25	25
M775.6Q	Mean	3.16	0.1	2.31	0.14	0.044	6.78	61.6	3.33	25.2	14.4	17.1	61.4
	Median	2.94	0.07	2.16	0.13	0.047	6.77	63.4	3.12	26.5	14	16.3	66
	Minimum	1.56	-0.02	0.45	0.064	-0.01	2.52	45	2.13	17	7.51	10.8	29.5
	Maximum	6.53	0.3	5	0.25	0.1	10.2	75	5.25	32.4	22.6	24.7	103
	Std. dev.	1.099	0.084	1.061	0.054	0.027	1.995	9.667	0.701	4.492	3.93	3.824	22.82
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
M781.2O	Mean	3.01	0.09	2.25	0.13	0.044	6.73	61.1	3.3	25	14.6	18.3	59.9
	Median	2.93	0.06	2.15	0.13	0.046	6.69	62.3	3.15	25.9	14.1	15.9	56.9
	Minimum	1.65	-0.02	0.48	0.067	-0.01	3.13	44.5	1.77	16.4	7.86	10.1	24.6
	Maximum	4.98	0.3	4.37	0.21	0.086	9.8	74.9	6.99	31.8	27.1	35.9	104
	Std. dev.	0.856	0.074	0.945	0.048	0.024	1.696	8.911	1.015	4.071	4.677	6.145	20.89
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
M786.2C	Mean	3.24	0.1	2.47	0.2	0.045	6.43	59.5	3.27	24.4	13.5	17.1	61.6
	Median	3.13	0.07	2.23	0.14	0.041	6.7	62.8	2.97	25.3	12.2	15.8	56.4
	Minimum	1.78	0.03	0.54	0.078	-0.01	0.088	-0.01	1.32	-0.01	1.51	10.8	25.3
	Maximum	5.16	0.6	4.56	1.25	0.089	9.75	74.5	7.44	32.8	22.3	24.9	104
	Std. dev.	0.857	0.114	0.951	0.232	0.026	2.197	15.74	1.154	6.908	4.64	4.085	21.87
	N obs.	23	24	24	24	24	24	24	24	24	24	24	24

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1995 Near-surface measurements:							
M786.5D	Mean	3.16	0.09	2.18	0.14	0.041	6.34	55.9	3.09	23.1	12.9	15.8	53.4
	Median	2.88	0.07	2.08	0.12	0.04	6.54	56.9	2.91	22.4	13.2	14	49.2
	Minimum	1.86	0.02	0.53	0.049	-0.01	-0.05	6.92	2.13	2.79	1.18	9.65	-0
	Maximum	7.3	0.3	4.41	0.26	0.067	9.24	73.5	5.58	32.8	22.7	24.1	103
	Std. dev.	1.135	0.073	0.902	0.059	0.02	2.126	13.56	0.762	6.103	4.925	4.148	25.2
	N obs.	24	24	24	24	24	24	24	24	24	24	24	24
M796.9M	Mean	3.26	0.1	2.51	0.15	0.047	6.72	62.1	3.46	25.6	15.1	18	65.5
	Median	3.11	0.07	2.2	0.13	0.055	6.7	64.6	3.24	26	14.3	16.2	71.8
	Minimum	2.03	0.03	0.49	0.057	-0.01	3.25	39.5	2.55	14.8	8.33	8.88	21.5
	Maximum	5.82	0.6	4.73	0.3	0.097	9.85	77.2	7.11	34.9	33.1	46.2	126
	Std. dev.	0.976	0.12	1.153	0.069	0.026	1.846	10.05	1.003	5.03	5.526	6.931	26.14
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
M796.9N	Mean	2.94	0.09	2.12	0.14	0.042	6.66	57.2	3.33	23.4	14.2	16.6	56.4
	Median	2.74	0.06	2.02	0.14	0.047	6.63	58.6	3.06	23.4	12.8	13.9	55.5
	Minimum	1.61	0.03	0.53	0.059	-0.01	3.04	36.7	2.25	13.2	6.41	11	19.2
	Maximum	4.52	0.2	4.25	0.25	0.08	9.23	71.8	8.13	32.3	36.7	46.7	104
	Std. dev.	0.706	0.062	0.864	0.062	0.023	1.555	8.983	1.172	4.188	6.761	7.447	20.81
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
VM00.1M	Mean	3.8	0.09	2.91	0.19	0.053	7.18	67.2	3.47	27.4	15.7	22.3	60.1
	Median	3.81	0.04	2.77	0.15	0.052	7.58	71.4	3.06	29.6	15.4	21.3	64.7
	Minimum	2.33	-0.02	0.7	0.045	-0.01	1.93	7.25	2.07	2.89	1.72	15	24
	Maximum	5.82	0.7	4.95	0.34	0.11	11.6	85.7	7.29	37.3	25.8	30.8	108
	Std. dev.	0.811	0.133	1.064	0.086	0.03	2.361	15.5	1.209	6.657	4.771	4.431	26.14
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
WW01.3M	Mean	3.94	0.04	3.72	0.089	0.014	6.51	72.8	1.99	27.6	6.31	11.9	18.2
	Median	3.78	0.04	3.81	0.062	0.011	6.57	71.8	1.77	27.2	6.06	11.9	14.8
	Minimum	3.4	-0.02	1.16	0.038	-0.01	4.96	40.6	1.05	16.9	3.61	9.32	12.3
	Maximum	5.26	0.08	4.74	0.38	0.072	7.92	87.1	4.95	33.7	10.6	19.9	108
	Std. dev.	0.475	0.017	0.688	0.072	0.014	0.848	8.387	0.857	3.533	1.529	1.961	18.65
	N obs.	24	24	24	24	25	25	25	25	25	25	25	25
ZM00.1M	Mean	4.91	0.03	4.5	0.11	0.012	5.31	76.6	2.35	27.6	12.3	21.5	21
	Median	4.57	0.02	4.27	0.071	-0.01	5.21	74.9	2.16	27.5	12.2	21.5	21.3
	Minimum	2.34	-0.02	2.06	0.02	-0.01	2.11	62.4	1.44	20.3	7.21	7.16	14.7
	Maximum	9.2	0.3	8.12	0.38	0.055	7.41	100	5.4	36.2	18.7	29.6	26.3
	Std. dev.	1.671	0.054	1.653	0.084	0.011	1.13	9.226	0.926	3.862	3.152	4.617	2.572
	N obs.	24	24	24	24	24	24	24	24	24	24	24	24

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1995 Near-bottom measurements:							
M764.3A	Mean	3.08	0.09	2.28	0.13	0.05	6.73	62.7	3.38	26	13.9	17	63
	Median	2.96	0.07	2.19	0.11	0.04	6.89	65.2	2.94	27.3	13.4	15.8	56
	Minimum	1.55	0.03	0.67	0.059	-0.01	2.47	45.5	2.31	16.7	8.38	1.22	5.97
	Maximum	4.45	0.3	4.03	0.28	0.12	10.7	78.3	6.36	34.2	22.5	35.6	104
	Std. dev.	0.818	0.071	0.926	0.055	0.034	1.835	10.73	0.935	5.142	3.527	6.428	27.43
	N obs.	24	23	23	24	24	24	23	23	23	23	24	24
M766.0I	Mean	3.13	0.1	2.15	0.13	0.051	6.64	62.5	3.55	25.6	14.3	17.8	63.4
	Median	3.18	0.07	2.18	0.12	0.052	6.74	64.2	3.27	27.1	13.7	16	61
	Minimum	1.57	-0.02	-0.01	0.059	-0.01	2.65	44.6	2.7	16.7	8.05	10.9	25.8
	Maximum	4.36	0.3	4.05	0.28	0.12	10.5	75	8.76	34.1	23.6	34.7	106
	Std. dev.	0.806	0.071	0.992	0.059	0.029	1.784	9.528	1.233	4.605	4.186	5.344	24.52
	N obs.	25	25	25	25	25	24	25	25	25	25	24	24
M771.2P	Mean	3.85	0.1	2.28	0.14	0.055	6.74	62.2	3.42	25.5	14.5	16.5	55.3
	Median	3.06	0.09	2.18	0.12	0.053	6.76	63.7	3.15	26.6	13.9	15.6	48.6
	Minimum	1.63	0.03	0.48	0.065	-0.01	2.77	41.3	1.95	17.2	6.85	8.44	-0
	Maximum	12.2	0.4	3.97	0.44	0.12	10.5	75.8	7.47	33.8	23.8	30.9	100
	Std. dev.	2.265	0.086	0.913	0.079	0.033	1.885	10.25	1.062	4.895	4.493	5.962	26.06
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
M775.6Q	Mean	3.14	0.1	2.25	0.15	0.051	6.7	62.4	3.49	25.4	14.3	17	59.4
	Median	3	0.1	2.15	0.13	0.043	6.79	63.3	3.33	26.4	13.9	16	51.6
	Minimum	1.66	0.02	0.45	0.057	-0.01	2.98	44.7	2.46	16.6	7.32	8.63	24
	Maximum	4.97	0.8	4.11	0.37	0.14	10.1	74.1	6.6	32.3	22.9	28.5	96.3
	Std. dev.	0.878	0.171	0.963	0.073	0.033	1.628	9.217	0.901	4.237	3.982	4.993	21.94
	N obs.	25	25	25	25	25	25	25	25	25	25	25	25
M781.2O	Mean	3.11	0.1	2.29	0.16	0.047	6.62	62.3	3.35	25.5	14.6	17.4	58.6
	Median	2.87	0.1	2.09	0.13	0.043	6.72	63.1	3.09	25.7	14.5	16.1	58.7
	Minimum	1.83	0.03	0.48	0.08	-0.01	0.075	42.3	0.96	15.7	7.76	7.14	-0
	Maximum	5.22	0.4	4.34	0.32	0.1	10	78.1	7.23	33.3	29.3	30.2	105
	Std. dev.	0.924	0.095	1.032	0.076	0.028	2.261	9.868	1.079	4.605	4.955	5.403	25.1
	N obs.	24	25	25	25	25	25	25	25	25	25	25	25

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1996 Near-surface measurements:							
CH00.1M	Mean	1.26	0.1	0.69	0.086	0.029	5.11	15.2	2.05	6.24	2.39	5.04	4.44
	Median	1.14	0.04	0.52	0.076	0.019	5.37	15.3	1.89	5.96	2.01	4.86	4.02
	Minimum	0.56	-0.02	0.25	0.02	-0.01	2.57	7.27	0.96	2.79	-0.01	1.74	1.67
	Maximum	2.26	0.6	1.58	0.2	0.15	7.88	24.6	5.49	11.2	6.09	8.73	6.95
	Std. dev.	0.445	0.136	0.403	0.04	0.03	1.442	5.017	0.908	2.286	1.552	1.547	1.39
	N obs.	24	20	24	18	24	24	24	24	24	24	24	24
CN00.1M	Mean	3.77	0.2	3.01	0.21	0.045	6.29	74.7	4.37	25.7	10.5	23.2	26.8
	Median	3.47	0.05	2.54	0.16	0.024	6.47	74.7	4.23	26.7	9.63	23	24.4
	Minimum	1.78	-0.02	0.83	0.076	-0.01	0.7	43.7	2.67	15.7	0.073	10.7	15.2
	Maximum	7.06	1.3	6.58	1.12	0.36	9.59	103	8.7	34	22.1	34.4	40.5
	Std. dev.	1.535	0.287	1.409	0.229	0.072	2.258	16.42	1.154	5.996	4.669	5.817	6.58
	N obs.	24	20	24	19	24	24	24	24	24	24	24	24
M738.2F	Mean	2.28	0.1	1.48	0.13	0.042	5.46	47.6	3.6	18.5	9.24	15.4	32.5
	Median	2.22	0.06	1.17	0.1	0.037	5.64	46.2	3.51	17.1	9.28	16.1	30.3
	Minimum	0.88	-0.02	0.35	0.078	-0.01	2.3	25.9	2.34	9.36	1.92	10.1	18.5
	Maximum	5.11	0.5	4.13	0.42	0.19	7.65	75.8	5.85	30.1	14.1	21.9	53
	Std. dev.	1.001	0.139	0.916	0.079	0.04	1.446	12.13	0.954	5.297	3.012	2.909	10.54
	N obs.	23	19	23	18	23	23	23	23	23	23	23	23
M742.6B	Mean	2.83	0.1	1.37	0.18	0.026	4.9	50.2	3.44	20	8.86	14.2	27.8
	Median	2.36	0.04	1	0.13	0.015	5.09	49.6	3.06	19.2	8.89	14.4	27.9
	Minimum	0.56	-0.02	0.095	0.072	-0.01	1.67	25.6	1.62	9.75	3.12	8.72	9.57
	Maximum	18.1	0.8	3.63	0.8	0.24	7.92	72	8.34	29.6	14.8	23.8	57.1
	Std. dev.	3.437	0.179	1.019	0.173	0.048	1.67	12.05	1.311	5.345	2.829	4.051	10.3
	N obs.	23	19	23	18	23	23	23	23	23	23	23	23
M742.8D	Mean	2.23	0.1	1.39	0.14	0.049	5.16	47.5	3.55	18.5	9.05	15	31.1
	Median	2.12	0.07	1.38	0.12	0.026	5.3	47.3	3.42	17.2	9.02	15.8	29
	Minimum	0.34	-0.02	-0.01	0.074	-0.01	1.52	22.7	2.37	8.46	4	8.01	16.5
	Maximum	4.82	0.5	3.83	0.3	0.27	8.56	74	6.39	30.5	13.5	27.2	57.4
	Std. dev.	1.032	0.131	0.972	0.066	0.072	1.668	13.27	1.028	5.726	2.799	4.653	10.82
	N obs.	22	19	23	18	23	23	23	23	23	23	23	23
M745.2L	Mean	2.27	0.1	1.58	0.16	0.036	5.5	46	3.55	18.8	9.74	14.5	30
	Median	2.38	0.06	1.26	0.11	0.031	5.62	45.1	3.45	17.3	9.62	15.4	28.8
	Minimum	0.83	-0.02	0.33	0.069	-0.01	2.21	0.075	2.01	9.45	5.23	6.77	14.4
	Maximum	5.12	0.5	4.78	0.35	0.097	8.15	75.9	5.64	30	16.8	22.1	53
	Std. dev.	1.055	0.134	1.013	0.1	0.027	1.523	16.49	0.95	5.753	2.913	3.898	9.172
	N obs.	23	19	23	18	23	23	23	23	23	23	23	23

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1996 Near-surface measurements:							
M746.9Y	Mean	1.85	0.1	1.09	0.097	0.033	5.42	35.5	2.99	13.9	7.19	12.2	25.2
	Median	1.87	0.05	0.79	0.091	0.028	5.43	34.7	2.94	13.5	6.35	12.2	23.7
	Minimum	0.74	-0.02	-0.01	0.045	-0.01	2.59	12.7	1.35	4.57	1.64	4.26	6.58
	Maximum	3.07	0.5	2.37	0.17	0.079	8.19	60.8	4.83	25.8	12.4	17.8	49.5
	Std. dev.	0.654	0.13	0.676	0.031	0.02	1.445	11.91	0.822	5.483	2.925	3.087	8.921
	N obs.	24	20	24	19	24	24	24	24	24	24	24	24
M747.3R	Mean	2.5	0.1	1.66	0.16	0.038	5.68	48.4	3.53	18.7	9.44	15.3	32.1
	Median	2.55	0.07	1.41	0.11	0.031	6.02	48.7	3.33	17.5	9.5	16	30.7
	Minimum	0.89	-0.02	0.34	0.055	-0.01	2.43	24	2.4	9.28	4.95	10.1	19.2
	Maximum	5.37	0.5	4.86	0.54	0.15	7.91	78.4	6.06	30.3	14.3	21.4	51.8
	Std. dev.	1.127	0.137	1.066	0.124	0.032	1.463	13.64	0.92	5.733	2.549	2.859	9.932
	N obs.	23	19	23	18	23	23	23	23	23	23	23	23
M752.8Y	Mean	2.22	0.1	1.45	0.13	0.047	5.67	50	3.69	19.7	10.2	16	36.5
	Median	2.11	0.1	1.15	0.1	0.038	5.91	49.9	3.51	19	10.8	16.4	35.7
	Minimum	1.03	-0.02	0.32	0.059	-0.01	2.36	25	2.34	9.48	5.72	8.65	24
	Maximum	5.25	0.5	5.12	0.31	0.13	8	80.4	6.12	34.2	15.5	25.7	55.6
	Std. dev.	0.96	0.146	1.044	0.066	0.034	1.571	13.75	0.985	6.163	2.706	3.864	9.861
	N obs.	23	19	23	17	23	23	23	23	23	23	23	23
M752.8Z	Mean	1.74	0.1	1.01	0.11	0.033	5.18	30.6	2.85	12.3	5.82	10.2	19.7
	Median	1.76	0.06	0.81	0.1	0.028	5.23	29	2.67	11.8	6.1	10.6	19.2
	Minimum	0.71	-0.02	0.26	0.075	-0.01	2.64	8.96	1.77	3.44	-0.01	3.96	4.54
	Maximum	2.66	0.6	1.9	0.2	0.075	7.37	50.1	5.19	21.2	10.7	15.5	41.8
	Std. dev.	0.597	0.14	0.538	0.04	0.019	1.34	11.3	0.75	5.011	2.951	3.182	8.713
	N obs.	23	19	23	17	23	23	23	23	23	23	23	23
M753.1X	Mean	2.23	0.1	1.52	0.12	0.041	5.71	49.9	3.73	19.6	10.5	16.3	37.1
	Median	2.02	0.08	1.34	0.11	0.034	5.83	47	3.69	18	10.6	18	31.1
	Minimum	0.85	-0.02	0.077	0.059	-0.01	2.33	25.8	2.25	10.1	4.97	8.8	23.4
	Maximum	5.19	0.5	5	0.39	0.13	7.77	82	5.73	34.1	15.9	22.1	69.6
	Std. dev.	0.967	0.143	1.047	0.072	0.03	1.387	13.43	0.87	5.837	3.262	3.639	12.29
	N obs.	24	20	24	19	24	24	24	24	24	24	24	24
M757.2Z	Mean	1.58	0.1	0.82	0.11	0.026	4.98	28.1	2.68	11.1	5.31	9.33	17.4
	Median	1.41	0.04	0.75	0.088	0.027	5.05	29.4	2.52	11.3	4.75	9.28	15.3
	Minimum	0.73	-0.02	0.044	0.048	-0.01	2.67	7.14	1.74	2.75	-0.01	3.03	3.54
	Maximum	3.16	0.5	1.73	0.47	0.052	7.47	45.5	5.43	19.3	9.42	15.4	40.6
	Std. dev.	0.651	0.128	0.566	0.091	0.014	1.302	10.14	0.75	4.445	2.587	3.225	9.033
	N obs.	24	20	24	19	24	24	24	24	24	24	24	24

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1996 Near-surface measurements:							
M764.3A	Mean	2.66	0.2	1.58	0.13	0.047	5.98	51.6	3.82	20.1	10.8	17.4	41.9
	Median	2.42	0.09	1.14	0.11	0.043	6.1	51.5	3.66	19.1	11.6	18	38.3
	Minimum	1.1	-0.02	0.36	0.066	-0.01	2.35	28.7	1.47	11.3	5.92	9.05	18.6
	Maximum	7.63	0.6	5.3	0.35	0.13	8.97	70	6.09	29.3	17.9	22.8	87
	Std. dev.	1.47	0.144	1.073	0.068	0.035	1.761	11.23	0.99	4.991	3.312	3.987	16.01
	N obs.	24	20	24	19	24	24	24	24	24	24	24	24
M766.0I	Mean	2.29	0.2	1.56	0.12	0.042	5.93	52.7	3.74	20.5	11.2	16.9	39.7
	Median	2.21	0.1	1.14	0.12	0.03	6.13	51.4	3.69	19.7	10.7	17.9	35.9
	Minimum	1.02	-0.02	0.36	0.052	-0.01	2.69	28.5	2.64	10.9	5.09	5.88	21.9
	Maximum	5.55	0.5	5.23	0.2	0.11	8.99	71	5.55	29.8	17.5	22.3	84.8
	Std. dev.	1.076	0.134	1.052	0.043	0.028	1.63	12.09	0.794	5.51	3.65	4.19	15.29
	N obs.	24	20	24	19	24	24	24	24	24	24	24	24
M771.2P	Mean	2.62	0.2	1.56	0.13	0.044	5.9	49.4	3.71	19.1	10.9	17.5	37.4
	Median	2.35	0.1	1.33	0.12	0.033	5.89	52.2	3.78	18.9	9.6	16.9	32
	Minimum	1.03	-0.02	0.4	0.074	-0.01	2.48	6.55	2.22	2.67	1.57	4.91	18.4
	Maximum	8.29	0.4	4.66	0.23	0.18	8.75	77.4	5.55	30.5	39.1	43.7	62.7
	Std. dev.	1.514	0.12	0.931	0.037	0.039	1.579	15.96	0.771	6.758	6.992	7.034	11.58
	N obs.	24	20	24	19	24	24	24	24	24	24	24	24
M775.6Q	Mean	2.43	0.2	1.53	0.12	0.037	5.88	51.8	3.69	20.1	12	18.5	38.2
	Median	2.6	0.1	1.6	0.11	0.03	5.96	50.6	3.72	18.8	11.5	17.8	35.3
	Minimum	1.13	0.02	0.49	0.046	-0.01	2.39	25.1	2.43	9.05	5.05	5.79	17.4
	Maximum	5.75	0.4	3.89	0.25	0.089	8.33	74.2	6.18	30.6	24.6	37.2	63.6
	Std. dev.	0.977	0.124	0.792	0.044	0.024	1.572	12.82	0.777	5.473	4.902	6.625	13.02
	N obs.	25	21	25	20	25	25	25	25	25	25	25	25
M781.2O	Mean	2.5	0.1	1.49	0.14	0.039	5.97	51.3	3.64	19.9	11	16.6	37.8
	Median	2.34	0.1	1.47	0.12	0.026	6.18	50.1	3.45	18.6	9.98	16.8	33.6
	Minimum	1.13	-0.02	0.56	0.083	-0.01	2.55	25.1	2.07	9.11	3.83	2.46	3.45
	Maximum	7.8	0.3	3.61	0.37	0.1	8.66	78.3	6.18	32	18.2	24.4	85.3
	Std. dev.	1.382	0.104	0.748	0.07	0.029	1.584	14.24	0.934	6.238	3.834	4.833	16.98
	N obs.	24	20	24	19	24	24	24	24	24	24	24	24
M786.2C	Mean	2.48	0.2	1.53	0.15	0.035	5.85	53.1	3.79	20.6	12.2	19.3	42.2
	Median	2.65	0.08	1.48	0.14	0.028	6.06	49.4	3.78	18.9	10.6	17.6	36
	Minimum	1.34	-0.02	0.66	0.091	-0.01	2.51	25.3	2.16	9.26	4.9	12.5	24.3
	Maximum	4.67	0.6	3.57	0.32	0.1	8.14	82.8	6.18	34.7	23.8	35.7	90
	Std. dev.	0.847	0.164	0.725	0.058	0.025	1.511	15.36	1.023	6.807	4.895	5.085	15.89
	N obs.	24	20	24	19	24	24	24	24	24	24	24	24

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
1996 Near-surface measurements:													
M786.5D	Mean	2.42	0.2	1.44	0.14	0.033	5.83	51	3.76	20.1	11.6	17.3	39.5
	Median	2.5	0.08	1.44	0.12	0.024	6.01	48.8	3.78	17.9	11	16.2	34.3
	Minimum	1.24	-0.02	0.44	0.086	-0.01	2.84	25.8	2.19	9.37	3.63	6.14	16.3
	Maximum	3.98	0.5	3.21	0.29	0.098	8.43	77.6	6.09	32.4	21.9	32	89
	Std. dev.	0.731	0.139	0.695	0.051	0.026	1.439	14.85	0.87	6.665	4.52	5.604	17.17
	N obs.	24	20	24	19	24	24	24	24	24	24	24	24
M796.9M	Mean	2.6	0.2	1.55	0.15	0.039	5.8	54.4	3.97	21.4	12.7	19.2	42.1
	Median	2.39	0.08	1.43	0.14	0.033	6.12	50.1	3.96	18.9	11.8	18.2	35.2
	Minimum	1.28	-0.02	0.65	0.1	-0.01	2.6	25.9	2.19	9.46	5.42	8.39	24.4
	Maximum	5.62	0.5	4.01	0.32	0.099	8.69	89.6	6.15	36.4	30.1	44.6	72.2
	Std. dev.	1.1	0.138	0.816	0.057	0.028	1.632	16.93	0.925	7.604	5.345	6.958	14.9
	N obs.	24	20	24	19	24	24	24	24	24	24	24	24
M796.9N	Mean	2.28	0.2	1.38	0.15	0.033	5.83	49.3	3.67	19.3	11.6	17.3	38.3
	Median	2.37	0.09	1.4	0.12	0.024	5.6	46	3.66	17.9	10.7	16.3	32.1
	Minimum	1.46	-0.02	0.47	0.037	-0.01	2.91	22.4	2.55	8.06	2.72	4.51	12.7
	Maximum	3.24	0.4	2.36	0.57	0.094	8.48	73.6	5.19	30.2	29.4	45.6	87.2
	Std. dev.	0.593	0.125	0.589	0.112	0.023	1.434	15.02	0.706	6.62	5.485	7.3	16.91
	N obs.	24	20	24	18	24	24	24	24	24	24	24	24
VM00.1M	Mean	3.23	0.2	2.24	0.22	0.061	6.52	60.3	4.06	22.6	13.7	23.2	39.4
	Median	3.06	0.06	2.1	0.17	0.029	6.64	56.2	3.57	21.8	13.6	22.9	35.1
	Minimum	1.47	-0.02	0.62	0.094	-0.01	2.1	31.6	2.07	0.15	0.87	11	15.3
	Maximum	5.65	1.6	4.76	0.8	0.56	9.51	94.9	10.7	37.8	23	37.1	93
	Std. dev.	1.09	0.35	1.03	0.162	0.11	1.931	14.36	1.741	7.659	5.103	6.527	20.05
	N obs.	24	20	24	18	24	24	24	24	24	24	24	24
WW01.3M	Mean	3.8	0.08	3.55	0.16	0.018	5.93	69.9	2.51	25.9	4.41	11.9	12.1
	Median	3.42	0.04	3.44	0.083	-0.01	6.11	73.2	2.19	26.6	4.54	11.9	11.7
	Minimum	1.64	-0.02	2.55	0.05	-0.01	1.61	41.7	1.56	15.9	-0.01	6.55	5.7
	Maximum	6.32	0.6	5.42	0.78	0.13	8.31	90.4	6.69	33.4	7.4	15.5	16.3
	Std. dev.	1.168	0.138	0.747	0.18	0.026	1.469	12.71	1.15	5.152	1.486	1.691	2.051
	N obs.	22	19	22	17	23	23	23	23	23	23	23	23
ZM00.1M	Mean	3.94	0.08	3.69	0.19	0.02	4.89	73.4	3.2	25.6	10.9	21.4	16.8
	Median	3.78	0.03	3.34	0.076	-0.01	5.18	73.1	2.97	25.9	10.9	22	16.8
	Minimum	1.11	-0.02	1.45	0.024	-0.01	2.01	34.7	1.98	10.5	4.95	2.84	1.96
	Maximum	8.04	0.7	6.46	1.09	0.15	7.5	147	6.48	54.2	16.4	32.7	29.7
	Std. dev.	1.885	0.156	1.364	0.314	0.036	1.464	22.17	1.003	8.408	4.062	7.351	5.428
	N obs.	23	19	22	17	23	23	23	23	23	23	23	23

Table E-2. Continued.

Sampling location	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
1996 Near-bottom measurements:													
M764.3A	Mean	2.44	0.2	1.66	0.13	0.046	5.87	54.1	3.91	21	10.8	17.6	41.5
	Median	2.26	0.1	1.53	0.11	0.035	6.02	53.7	3.9	20.4	10.8	17.9	37.4
	Minimum	1	-0.02	0.38	0.068	-0.01	2.32	30.8	2.52	12.1	6.09	9.86	27.2
	Maximum	6.19	1.4	5.31	0.39	0.18	8.97	74.6	6.06	31.1	16.9	23.6	62.3
	Std. dev.	1.174	0.317	1.103	0.084	0.04	1.77	12.23	0.928	5.595	3.276	3.588	11.4
	N obs.	23	19	23	19	23	23	23	23	23	23	23	23
M766.0I	Mean	2.5	0.2	1.59	0.13	0.039	5.88	53	3.79	20.7	11	16.9	41.3
	Median	2.48	0.1	1.42	0.12	0.034	6.07	52.3	3.72	19.6	10.9	17.6	38.4
	Minimum	1.09	-0.02	0.35	0.059	-0.01	2.34	28.1	2.61	11.1	6.18	9.14	25.3
	Maximum	5.62	1.2	5.18	0.26	0.13	8.64	71.6	5.88	29.6	15.7	25.8	84.3
	Std. dev.	1.187	0.257	1.067	0.05	0.03	1.602	12.73	0.801	5.824	3.232	4.402	14.82
	N obs.	23	19	23	19	23	23	23	23	23	23	23	23
M771.2P	Mean	2.4	0.2	1.55	0.13	0.046	5.92	54.1	3.98	21.1	12	18.7	40
	Median	2.38	0.2	1.35	0.12	0.036	5.95	54.7	3.9	19.6	11.8	18.9	37.1
	Minimum	1.16	0.03	0.35	0.039	-0.01	2.73	28.7	2.73	10.4	5.64	0.13	-0
	Maximum	5.26	0.5	4.63	0.27	0.18	9.01	84	6.27	33.6	37.1	49.8	64.4
	Std. dev.	0.899	0.115	0.98	0.054	0.039	1.865	14.51	0.859	6.458	6.325	8.619	15.09
	N obs.	23	19	23	19	23	23	23	23	23	23	23	23
M775.6Q	Mean	2.4	0.2	1.56	0.15	0.037	6.25	54	3.8	20.9	11.8	18.4	40
	Median	2.62	0.2	1.64	0.11	0.032	6.48	51	3.81	19.2	11.7	18.8	35.5
	Minimum	1.3	0.04	0.45	0.06	-0.01	2.38	31.3	2.43	12.2	5.44	7.73	25.4
	Maximum	5.13	0.4	4.68	0.5	0.093	9.1	82.4	5.88	32.1	27.2	30.8	88.9
	Std. dev.	0.881	0.1	0.912	0.093	0.025	1.674	13.73	0.819	6.025	4.492	5.29	15.17
	N obs.	25	21	25	20	25	25	25	25	25	25	25	25
M781.2O	Mean	2.36	0.2	1.56	0.15	0.036	6.09	52.3	3.83	20.3	11.4	17.7	38.6
	Median	2.4	0.1	1.66	0.13	0.03	6.16	49.5	3.75	18.4	10.8	17.2	34.4
	Minimum	1.13	-0.02	0.61	0.083	-0.01	2.68	25.8	2.55	9.37	4.2	8.6	-0
	Maximum	4.37	0.5	3.59	0.34	0.079	8.97	81.4	5.58	32.2	21.3	26	80
	Std. dev.	0.834	0.129	0.749	0.068	0.023	1.644	14.67	0.734	6.523	4.181	4.683	18.69
	N obs.	24	20	24	19	24	24	24	24	24	24	24	24

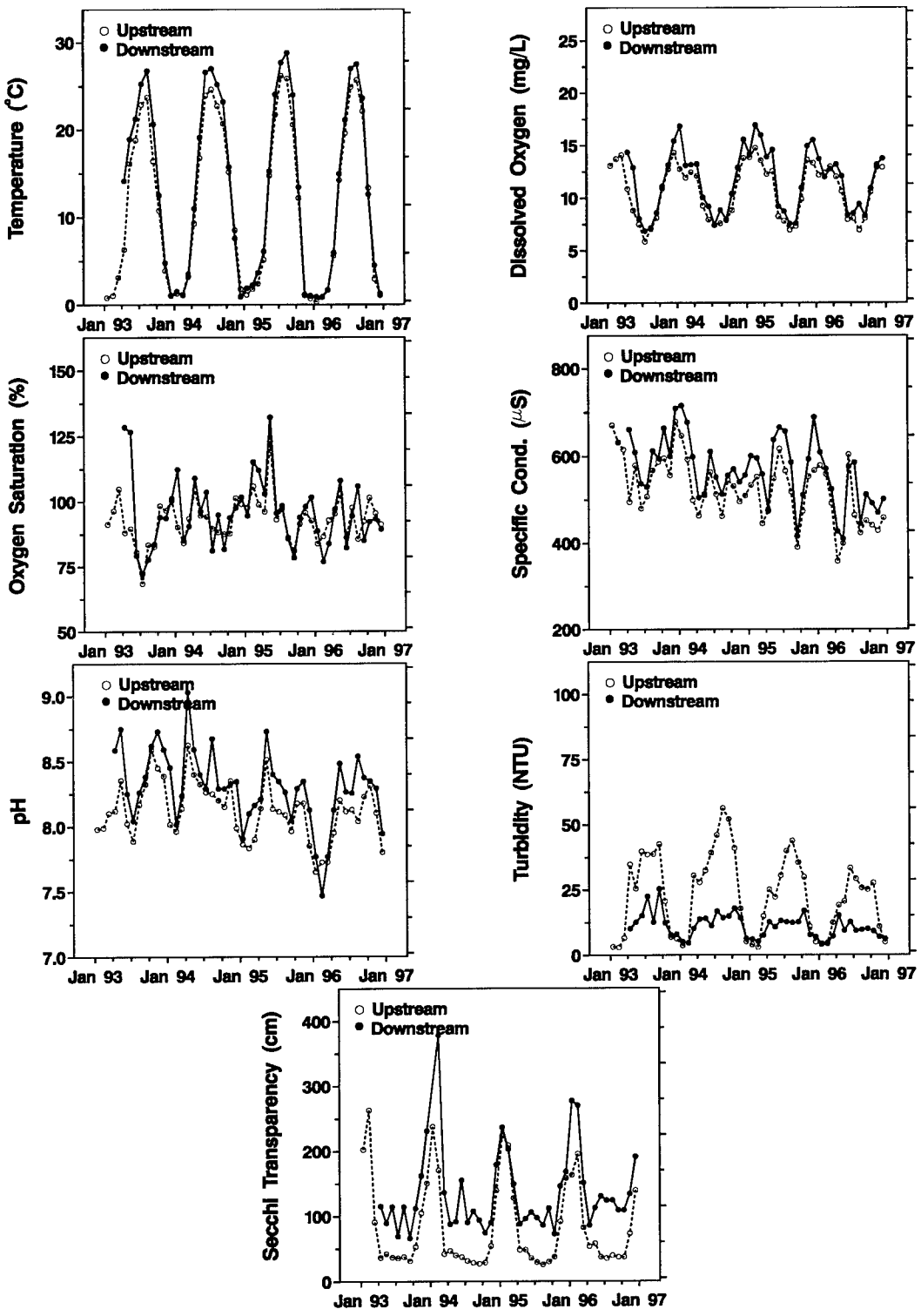

Figure E-1a. Monthly means of temperature (°C), dissolved oxygen (mg/L), oxygen saturation (%), pH, specific conductivity (µS), turbidity (NTU), and Secchi transparency (cm) at sites in upper and lower Pool 4 from 1993 through 1996.

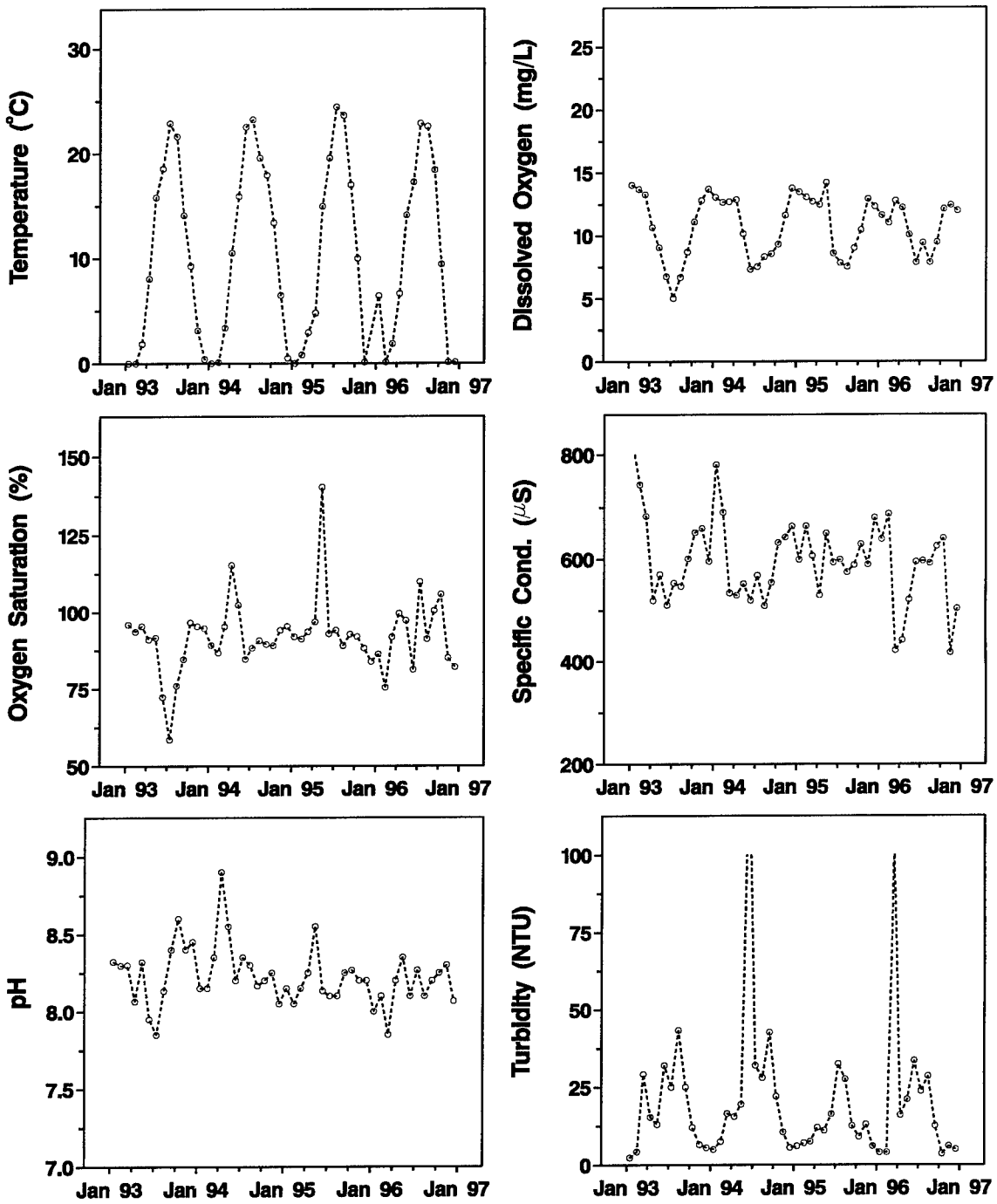

Figure E-1b. Monthly means of temperature (°C), dissolved oxygen (mg/L), oxygen saturation (%), pH, specific conductivity (µS), and turbidity (NTU) in the Cannon River from 1993 through 1996.

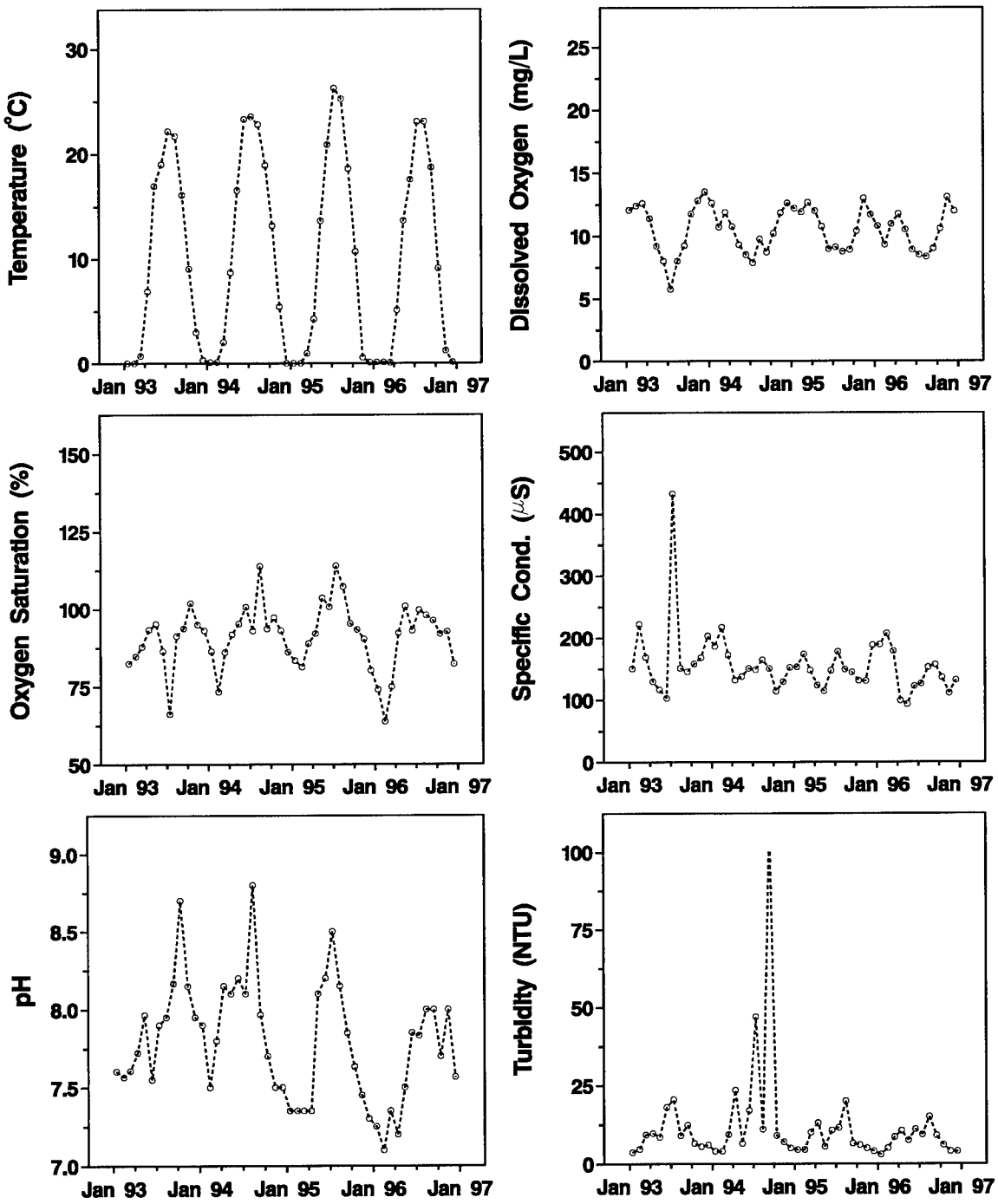

Figure E-1c. Monthly means of temperature (°C), dissolved oxygen (mg/L), oxygen saturation (%), pH, specific conductivity (µS), and turbidity (NTU) in the Chippewa River from 1993 through 1996.

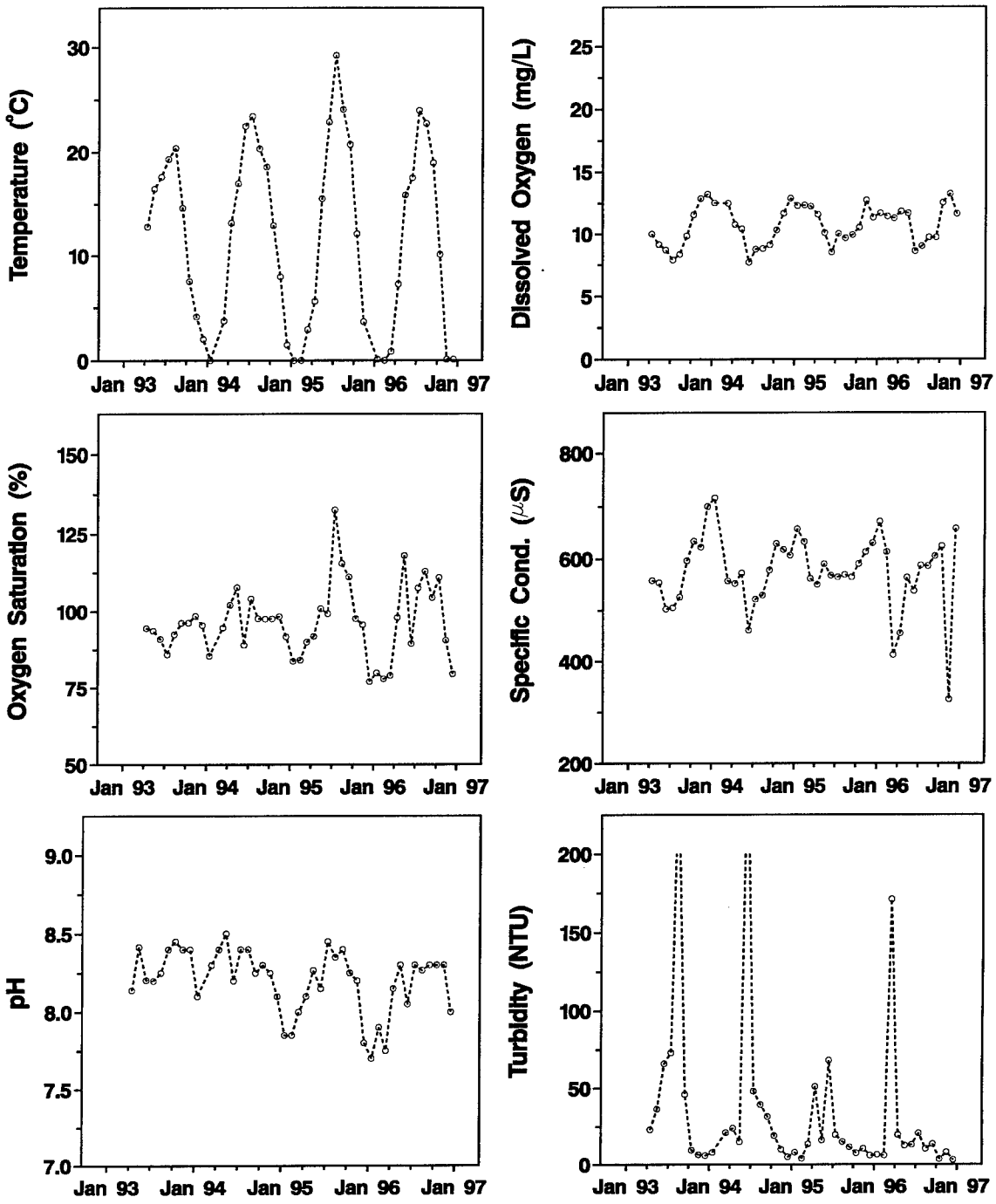

Figure E-1d. Monthly means of temperature (°C), dissolved oxygen (mg/L), oxygen saturation (%), pH, specific conductivity (µS), and turbidity (NTU) in the Zumbro River from 1993 through 1996.

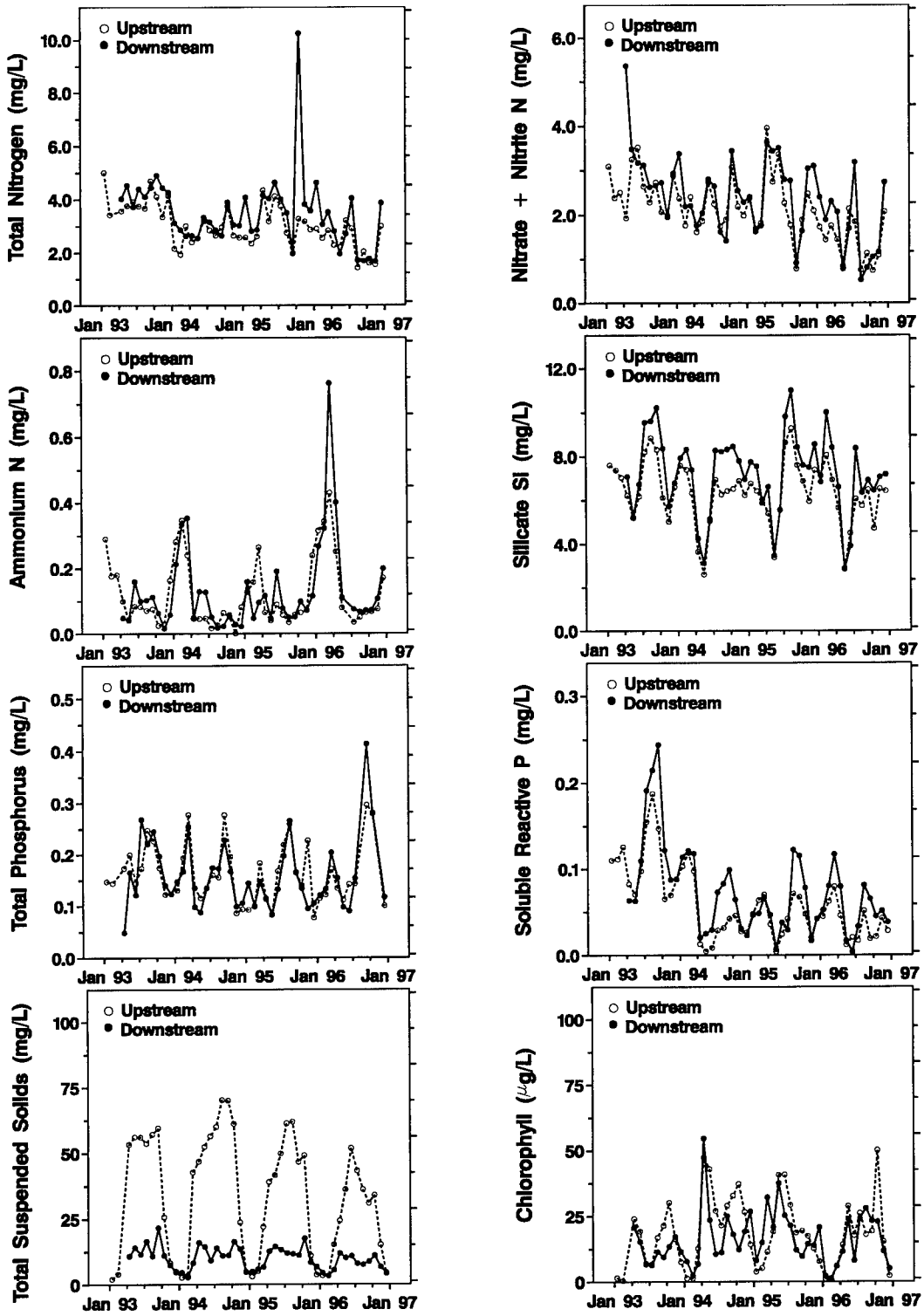

Figure E-2a. Monthly means of total nitrogen (mg/L), nitrate–nitrite nitrogen (mg/L), ammonium nitrogen (mg/L), silicate silicon (mg/L), total phosphorus (mg/L), soluble reactive phosphorus (mg/L), total suspended solids (mg/L), and chlorophyll *a* (μg/L) in upper and lower Pool 4 from 1993 through 1996.

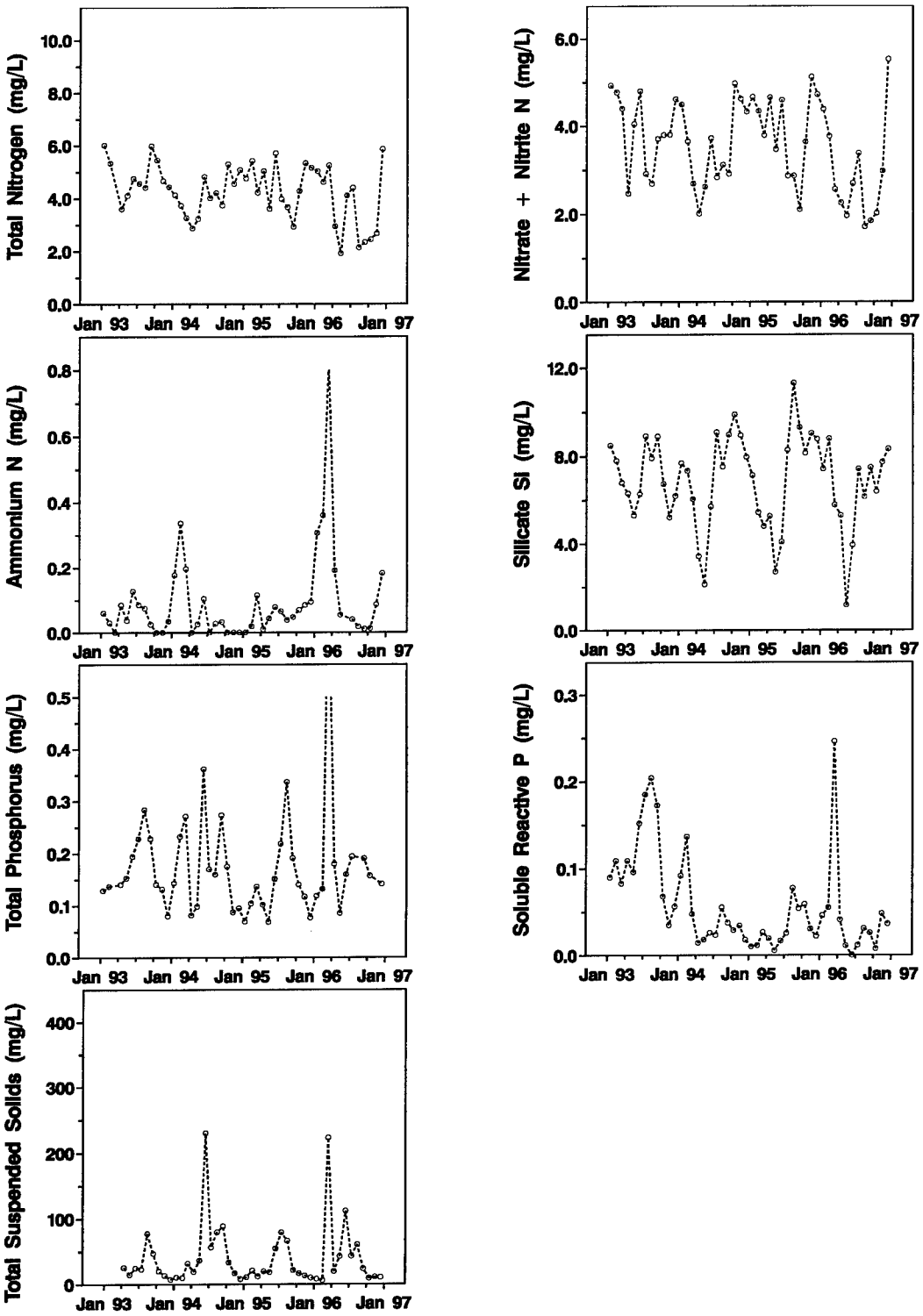

Figure E-2b. Monthly means of total nitrogen (mg/L), nitrate–nitrite nitrogen(mg/L), ammonium nitrogen (mg/L), silicate silicon (mg/L), total phosphorus (mg/L), soluble reactive phosphorus (mg/L), total suspended solids (mg/L), and chlorophyll *a* (µg/L) in the Cannon River from 1993 through 1996.

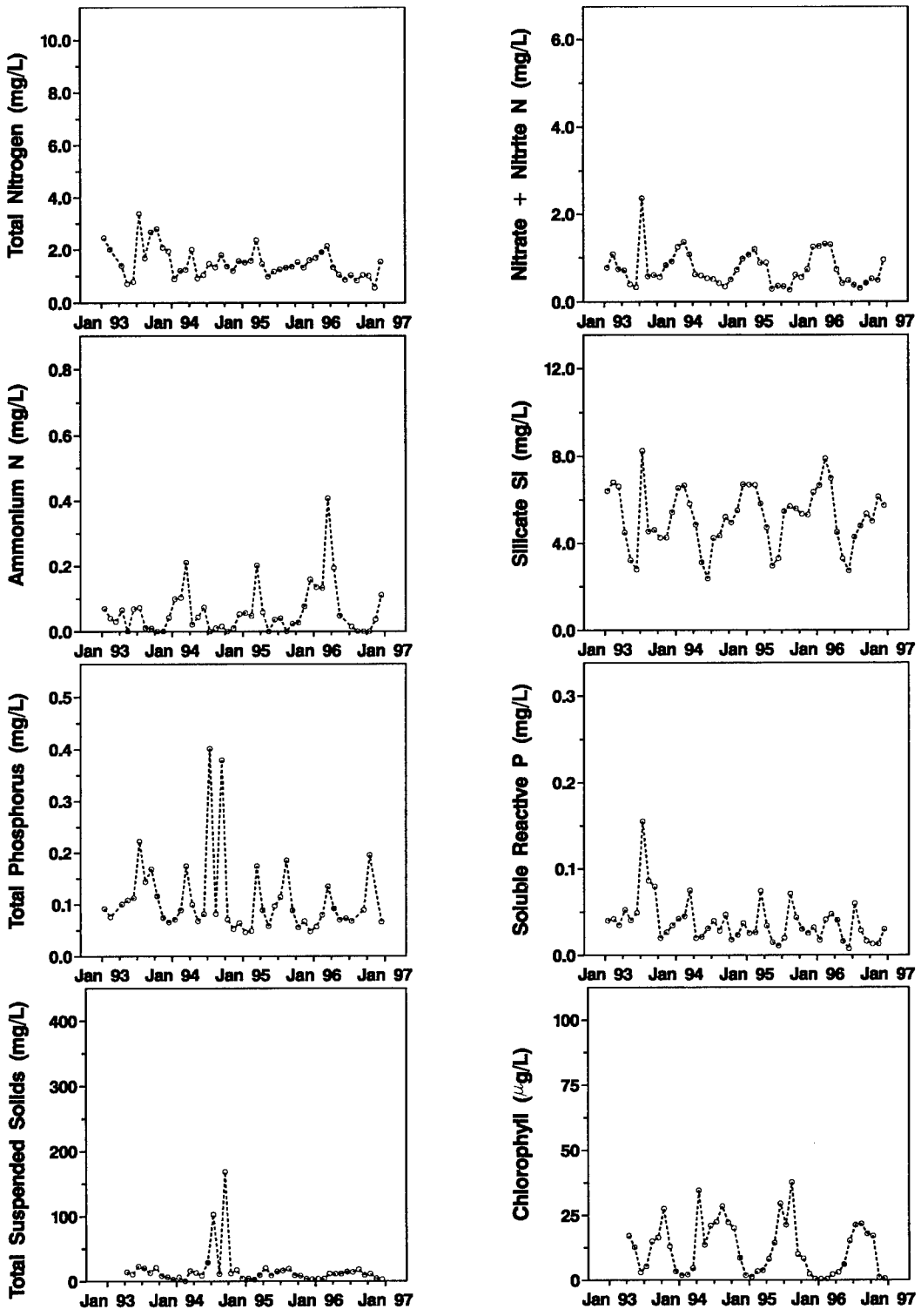

Figure E-2c. Monthly means of total nitrogen (mg/L), nitrate–nitrite nitrogen(mg/L), ammonium nitrogen (mg/L), silicate silicon (mg/L), total phosphorus (mg/L), soluble reactive phosphorus (mg/L), total suspended solids (mg/L), and chlorophyll *a* (µg/L) in the Chippewa River from 1993 through 1996.

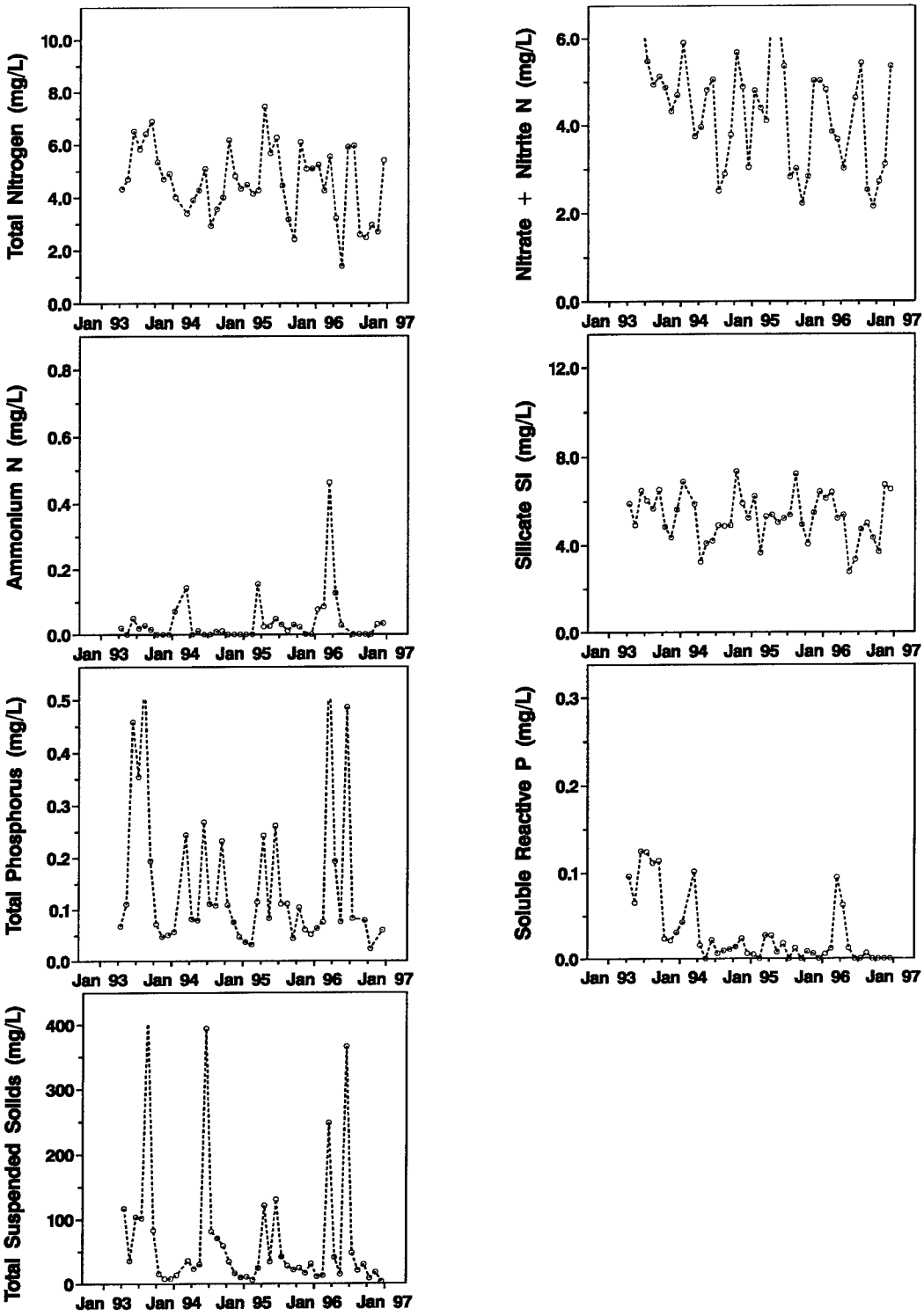

Figure E-2d. Monthly means of total nitrogen (mg/L), nitrate–nitrite nitrogen(mg/L), ammonium nitrogen (mg/L), silicate silicon (mg/L), total phosphorus (mg/L), soluble reactive phosphorus (mg/L), total suspended solids (mg/L), and chlorophyll *a* (µg/L) in the Zumbro River from 1993 through 1996.

In Appendix F, we summarize data from stratified random sampling (SRS) in both tabular and graphic forms. The tables contain summary statistics for each SRS episode and stratum divided into two parameter groups: (1) physical and biological measurements (Table F-1), and (2) chemical data (major plant nutrients; Table F-2). Within each parameter group, the data are divided by sampling depth into three groups (surface, middepth, and bottom). Chemical measurements are typically collected only at the surface and near bottom. The majority of all measurement are in the near-surface category and most episodes do not have chemical data from other depths. Refer to Appendix A for maps and descriptions of the individual sampling strata and episodes.

The figures (F-1–F-13) are box-whisker diagrams that connect the medians for each sampling episode from spring 1993 (Sp93) through fall 1996. The 10th and 90th percentiles for each episode are indicated by the lower and upper limits of the box. Vertical lines extend above and below each box to the minimum and maximum observed value or to the limits of the plotting axis.

Data that have been flagged as questionable in the Long Term Resource Monitoring Program database because of recorder error, instrument malfunction, sample damage, contamination, improper handling, analytical error, or other difficulties are excluded from this summary. Values that are below detection are indicated by the detection limit preceded by a negative sign. Below-detection values are included in the determination of minima, maxima, and medians, but in the calculation of means and standard deviations, values below detection have been replaced by a value equal to half the detection limit. The Secchi transparency data in this report do not include observations where Secchi transparency exceeded the water column depth. High transparency conditions are thus underrepresented.

Table F-1. Summaries of physical–biological measurements during each stratified random sampling episode from 1993 through 1996. Data are grouped into three sampling-depth categories: near-surface (less than or equal to 0.2 m below the surface), middepth, and near-bottom (less than or equal to 0.2 m above the substrate).

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1993 Near-surface measurements: summer																			
1. Main channel	Mean	0.2	4.56	—	—	—	—	—	23.2	6.84	81	529	8.1	59.8	19	24.5	6.6	11.1	7.24
	Median	0.2	4.3	—	—	—	—	—	23.2	6.8	80	541	8.1	61.5	16	15.3	5.9	9.98	6.33
	Minimum	0.2	0.6	—	—	—	—	—	22.8	6.3	74	422	7.9	37	7	8.8	3.7	7.07	4.48
	Maximum	0.2	9.8	—	—	—	—	—	23.8	7.7	91	564	8.1	86	33	49.6	11.2	16.4	14.8
	Std. dev.	0	2.44	—	—	—	—	—	0.29	0.3	3.84	34.9	0.06	15	7.83	14.2	2.58	4.76	2.59
	N obs.	25	25	0	0	0	0	0	25	25	25	25	25	24	25	25	25	3	25
2. Side channel	Mean	0.2	2.34	0.05	—	—	—	—	23.4	7.16	85	487	8.1	54	20	28	7.3	11.7	11.6
	Median	0.2	2.45	0.05	—	—	—	—	23.3	6.9	82	527	8	55	19	24.7	6.2	12.7	8.2
	Minimum	0.2	0.5	0.05	—	—	—	—	22.8	6.3	74	216	7.6	37	5	12.7	4.7	5.99	4.97
	Maximum	0.2	5.6	0.05	—	—	—	—	24.4	15	181	555	9	70	31	50	11.9	16.4	96.7
	Std. dev.	0	1.22	—	—	—	—	—	0.39	1.53	18.8	89.7	0.22	10.4	6.37	13.1	2.56	5.27	16.5
	N obs.	30	30	1	0	0	0	0	30	30	30	30	30	29	30	29	29	3	29
3. Backwater	Mean	0.2	1.52	0.21	—	—	—	—	23.5	7.96	95	450	8.1	55	18	23.4	7.6	13.1	22.2
	Median	0.2	1.5	0.17	—	—	—	—	23.3	7.1	84	479	8.1	54	17	20.6	6.9	9.06	9.17
	Minimum	0.2	0.4	0	—	—	—	—	22.1	2.8	33	252	7.3	35	10	11.5	2.9	7.48	1.39
	Maximum	0.2	3.5	0.62	—	—	—	—	26	19.9	248	564	9.4	87	36	111	24.4	26.8	187
	Std. dev.	0	0.74	0.17	—	—	—	—	0.87	3.22	40.8	103	0.38	9.73	4.42	14.1	3.79	9.21	38.8
	N obs.	50	50	50	0	0	0	0	50	50	50	50	50	47	50	50	50	4	50
4. Lake	Mean	0.2	7.16	0.07	—	—	—	—	24.8	7.98	97	552	8.2	59.2	14	13.8	6.2	15.6	14.4
	Median	0.2	7.7	0.06	—	—	—	—	24.2	7.45	89	554	8.2	58	15	13.1	6.4	14.4	12.5
	Minimum	0.2	2.2	0.04	—	—	—	—	23	6.3	75	530	8.1	42	6	7.8	3.5	8.73	4.64
	Maximum	0.2	11	0.12	—	—	—	—	27.9	10.5	130	566	8.4	80	21	20.7	8.2	23.7	32.9
	Std. dev.	0	2.65	0.02	—	—	—	—	1.45	1.28	18.3	9.94	0.1	11.6	4.03	3.25	1.29	7.56	7.4
	N obs.	30	30	21	0	0	0	0	30	30	30	30	30	30	30	30	30	3	30
1993 Near-bottom measurements: summer																			
2. Side channel	Mean	0.5	0.7	—	—	—	—	—	23.7	11.2	134	—	—	—	—	—	—	—	—
	Median	0.5	0.7	—	—	—	—	—	23.7	11.2	134	—	—	—	—	—	—	—	—
	Minimum	0.5	0.7	—	—	—	—	—	23.2	7.4	87	—	—	—	—	—	—	—	—
	Maximum	0.5	0.7	—	—	—	—	—	24.2	15	180	—	—	—	—	—	—	—	—
	Std. dev.	0	0	—	—	—	—	—	0.71	5.37	65.8	—	—	—	—	—	—	—	—
	N obs.	2	2	0	—	—	—	—	2	2	2	0	0	—	0	0	0	0	0

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1993 Near-bottom measurements: summer																			
3. Backwater	Mean	1.34	1.54	—	—	—	—	—	23.2	7.19	85	—	—	—	—	—	—	—	—
	Median	1.3	1.5	—	—	—	—	—	23.2	7	82	—	—	—	—	—	—	—	—
	Minimum	0.3	0.5	—	—	—	—	—	21.2	2.7	32	—	—	—	—	—	—	—	—
	Maximum	3.3	3.5	—	—	—	—	—	26	19.9	248	—	—	—	—	—	—	—	—
	Std. dev.	0.73	0.73	—	—	—	—	—	0.76	2.47	31	—	—	—	—	—	—	—	—
	N obs.	49	49	0	—	—	—	—	49	47	47	0	0	—	0	0	0	0	0
4. Lake	Mean	6.96	7.16	—	—	—	—	—	23.3	6.1	72	—	—	—	—	—	—	—	—
	Median	7.5	7.7	—	—	—	—	—	23.2	6.2	73	—	—	—	—	—	—	—	—
	Minimum	2	2.2	—	—	—	—	—	22.8	5	58	—	—	—	—	—	—	—	—
	Maximum	10.8	11	—	—	—	—	—	23.9	6.8	81	—	—	—	—	—	—	—	—
	Std. dev.	2.65	2.65	—	—	—	—	—	0.33	0.44	5.33	—	—	—	—	—	—	—	—
	N obs.	30	30	0	—	—	—	—	30	30	30	0	0	—	0	0	0	0	0
1993 Near-surface measurements: fall																			
1. Main channel	Mean	0.2	4.53	—	—	—	—	—	11.7	11.1	103	562	8.5	64.5	17	19.5	6.9	24.7	26.4
	Median	0.2	4.5	—	—	—	—	—	11.9	11	99	586	8.5	57.5	17	24.8	6.6	24.7	29.4
	Minimum	0.2	0.6	—	—	—	—	—	10.6	9.5	88	426	8.5	33	8	5.8	3.3	22.5	5.82
	Maximum	0.2	8.2	—	—	—	—	—	12.9	12.9	122	611	8.7	95	33	43	11.3	26.9	43.8
	Std. dev.	0	1.74	—	—	—	—	—	0.78	0.76	8.04	58.1	0.06	21.1	6.8	10.2	2.4	3.17	9.98
	N obs.	25	25	0	0	0	0	0	25	25	25	25	25	24	25	25	25	2	25
2. Side channel	Mean	0.2	2.62	0.1	—	—	—	—	10.8	11.5	103	539	8.6	65.8	19	23.1	7	37.3	31
	Median	0.2	1.85	0.1	—	—	—	—	10.8	11.3	104	578	8.6	72	14	14.2	6.6	38.1	30.6
	Minimum	0.1	0.1	0.1	—	—	—	—	8.9	9.2	81	397	8.2	27	10	9.7	4.1	33.7	15.7
	Maximum	0.2	6.7	0.1	—	—	—	—	12.5	13.4	117	611	8.9	86	115	160	12.3	40.1	59
	Std. dev.	0.02	1.86	—	—	—	—	—	1.06	0.84	7.21	74.3	0.15	17.6	18.8	27.1	2.01	3.28	9.2
	N obs.	30	30	1	0	0	0	0	30	30	30	30	30	28	30	30	30	3	30
3. Backwater	Mean	0.2	1.08	0.05	—	—	—	—	10.9	12.3	112	502	8.8	52.5	26	38	11.7	48.3	59.2
	Median	0.2	0.8	0.03	—	—	—	—	10.5	11.9	109	548	8.8	50	18	26.7	9.2	40.3	40.5
	Minimum	0.2	0.3	0	—	—	—	—	8.1	8.7	80	263	8.3	10	8	5.8	3	28.4	12.1
	Maximum	0.2	7.4	0.2	—	—	—	—	14.1	16.4	154	615	9.7	105	160	281	61.8	84.2	170
	Std. dev.	0	1.12	0.06	—	—	—	—	1.4	1.63	16.3	94.8	0.27	24.5	28.1	46	10.1	26.1	44
	N obs.	50	50	46	0	0	0	0	50	50	50	50	50	39	50	50	50	4	50

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1993 Near-surface measurements: fall																			
4. Lake	Mean	0.2	5.91	0.03	—	—	—	—	12.1	10.8	101	601	8.5	52.7	20	20.2	7	26.3	26.7
	Median	0.2	7	0.03	—	—	—	—	12.1	10.8	100	605	8.5	49	19	18.7	7	25.7	27.3
	Minimum	0.2	0.7	0.01	—	—	—	—	11.3	9.4	86	578	8.4	26	7	5.9	3.2	11.2	4.12
	Maximum	0.2	11.8	0.05	—	—	—	—	13	12.2	116	620	8.7	103	51	58	14.1	41.9	47.7
	Std. dev.	0	3.14	0.03	—	—	—	—	0.43	0.69	6.66	9.43	0.08	16.9	9.72	12.1	2.93	15.3	11.7
	N obs.	30	30	2	0	0	0	0	30	30	30	30	30	30	30	30	30	3	30
1993 Near-bottom measurements: fall																			
3. Backwater	Mean	1.16	1.36	—	—	—	—	—	10.7	12.2	110	—	—	—	—	—	—	—	—
	Median	0.8	1	—	—	—	—	—	10.1	11.9	107	—	—	—	—	—	—	—	—
	Minimum	0.3	0.5	—	—	—	—	—	8.1	8.2	75	—	—	—	—	—	—	—	—
	Maximum	7.2	7.4	—	—	—	—	—	13	16.4	146	—	—	—	—	—	—	—	—
	Std. dev.	1.24	1.24	—	—	—	—	—	1.2	1.62	14.6	—	—	—	—	—	—	—	—
	N obs.	35	35	0	—	—	—	—	35	35	35	0	0	—	0	0	0	0	0
4. Lake	Mean	5.71	5.91	—	—	—	—	—	11.4	9.78	90	—	—	—	—	—	—	—	—
	Median	6.8	7	—	—	—	—	—	11.2	9.65	89	—	—	—	—	—	—	—	—
	Minimum	0.5	0.7	—	—	—	—	—	11.1	8.7	79	—	—	—	—	—	—	—	—
	Maximum	11.6	11.8	—	—	—	—	—	12.3	11.6	107	—	—	—	—	—	—	—	—
	Std. dev.	3.14	3.14	—	—	—	—	—	0.4	0.76	7.56	—	—	—	—	—	—	—	—
	N obs.	30	30	0	—	—	—	—	30	30	30	0	0	—	0	0	0	0	0
1994 Near-surface measurements: winter																			
1. Main channel	Mean	0.2	3.76	0.01	90	27	84	4	0.49	11.3	78	546	7.9	218	3	1.8	1.1	2.04	0.13
	Median	0.2	3.6	0.01	100	30	100	4	0.2	12	82	554	8	192	3	1.8	1	2.14	0
	Minimum	0.2	1.1	0.01	40	17	10	1	0.1	2.8	20	330	7.6	145	2	1.4	0.8	1.64	0
	Maximum	0.2	7	0.01	100	34	100	10	1.9	13	92	656	8	300	4	2.8	1.6	2.34	0.79
	Std. dev.	0	1.88	—	21.4	6.66	31.1	3.2	0.58	2.43	16.8	72.1	0.11	62.6	0.62	0.39	0.22	0.36	0.27
	N obs.	15	15	1	8	8	8	8	15	15	15	15	15	13	15	15	15	3	15
2. Side channel	Mean	0.2	1.75	0	99.5	24	97	7	0.66	12	84	599	8	168	3	1.8	1.1	1.78	0.28
	Median	0.2	1.7	0	100	25	100	6	0.2	12.3	85	597	8	171	3	1.7	1	1.54	0
	Minimum	0.2	0.3	0	90	9	60	1	0.1	6.3	44	521	7.8	100	2	0.9	0.8	1.46	0
	Maximum	0.2	4.8	0	100	41	100	16	1.9	13.2	93	663	8.1	245	5	3.1	1.8	2.34	2.58
	Std. dev.	0	1.09	—	2.18	8.35	9.66	4.8	0.71	1.21	8.87	46.8	0.07	32.4	0.84	0.59	0.27	0.49	0.57
	N obs.	30	30	1	21	21	21	21	30	30	30	30	30	12	30	30	30	3	30

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1994 Near-surface measurements: winter																			
3. Backwater	Mean	0.2	1.22	0.04	98.8	33	98	10	0.39	10.6	73	573	7.9	134	4	2.8	1.5	8.54	4.38
	Median	0.2	0.9	0.03	100	34	100	10	0.2	11.6	80	570	8	135	3	1.8	1.1	3.21	0.66
	Minimum	0.2	0.4	0	40	15	40	2	0.1	0.6	4	210	7.6	50	2	1.2	0.6	1.64	0
	Maximum	0.2	5.7	0.25	100	45	100	22	2	13.5	93	774	8.2	210	13	18.6	6	27.3	33.2
	Std. dev.	0	0.95	0.04	8.57	6.69	11	4	0.44	2.7	18.5	102	0.13	48.8	1.79	2.96	0.99	10.8	8.64
	N obs.	49	49	46	49	49	49	49	49	49	49	49	49	15	49	49	49	5	49
4. Lake	Mean	0.2	6.06	—	100	38	99	7	0.29	12.8	88	668	8.1	153	3	2.4	1.2	5.24	2.05
	Median	0.2	7.4	—	100	39	100	8	0.2	12.7	88	669	8.1	140	3	2.2	1.3	5.24	1.07
	Minimum	0.2	0.7	—	100	15	90	1	0.1	11.5	79	613	7.9	109	2	1	0.8	3.53	0
	Maximum	0.2	9.6	—	100	53	100	12	0.9	14.4	99	710	8.2	232	4	11	1.8	6.95	7.7
	Std. dev.	0	2.89	—	0	7.53	2.54	2.9	0.25	0.81	5.47	23.1	0.09	36.4	0.58	1.72	0.25	2.42	2.45
	N obs.	30	30	0	30	30	30	30	30	30	30	30	30	27	30	30	30	2	30
1994 Near-bottom measurements: winter																			
1. Main channel	Mean	1.2	1.4	—	—	—	—	—	3.7	0.4	3	—	—	—	—	—	—	—	—
	Median	1.2	1.4	—	—	—	—	—	3.7	0.4	3	—	—	—	—	—	—	—	—
	Minimum	1.2	1.4	—	—	—	—	—	3.7	0.4	3	—	—	—	—	—	—	—	—
	Maximum	1.2	1.4	—	—	—	—	—	3.7	0.4	3	—	—	—	—	—	—	—	—
	Std. dev.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	N obs.	1	1	0	—	—	—	—	1	1	1	0	0	—	0	0	0	0	0
3. Backwater	Mean	1.34	1.54	—	—	—	—	—	0.62	10.5	73	—	—	—	—	—	—	—	—
	Median	1	1.2	—	—	—	—	—	0.2	11.4	79	—	—	—	—	—	—	—	—
	Minimum	0.5	0.7	—	—	—	—	—	0.1	2	14	—	—	—	—	—	—	—	—
	Maximum	5.5	5.7	—	—	—	—	—	3.1	13.2	93	—	—	—	—	—	—	—	—
	Std. dev.	1.01	1.01	—	—	—	—	—	0.8	2.62	17.5	—	—	—	—	—	—	—	—
	N obs.	33	33	0	—	—	—	—	33	33	33	0	0	—	0	0	0	0	0
4. Lake	Mean	5.86	6.06	—	—	—	—	—	1.18	11.3	80	—	—	—	—	—	—	—	—
	Median	7.2	7.4	—	—	—	—	—	0.9	11.4	80	—	—	—	—	—	—	—	—
	Minimum	0.5	0.7	—	—	—	—	—	0.1	5.2	40	—	—	—	—	—	—	—	—
	Maximum	9.4	9.6	—	—	—	—	—	3.9	14.6	102	—	—	—	—	—	—	—	—
	Std. dev.	2.89	2.89	—	—	—	—	—	0.94	1.98	12.7	—	—	—	—	—	—	—	—
	N obs.	30	30	0	—	—	—	—	30	30	30	0	0	—	0	0	0	0	0

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1994 Near-surface measurements: spring																			
1. Main channel	Mean	0.2	4.21	—	—	—	—	—	10.1	13.4	119	379	8.8	71.2	13	15.7	7.1	49.8	51.3
	Median	0.2	4.3	—	—	—	—	—	10	13.5	120	408	8.9	72	11	15.5	6.9	54.9	53.3
	Minimum	0.2	1.9	—	—	—	—	—	9	11.5	102	110	8.1	30	10	13.7	6.8	24.8	0
	Maximum	0.2	8.5	—	—	—	—	—	11.5	14.9	132	487	9	90	26	17.9	7.9	64.6	72.6
	Std. dev.	0	1.95	—	—	—	—	—	0.59	0.97	9.03	108	0.22	14.2	4.78	1.64	0.41	18.7	16.3
	N obs.	25	25	0	0	0	0	0	25	25	25	25	25	25	25	6	6	4	25
2. Side channel	Mean	0.2	2.51	—	—	—	—	—	10.6	13.4	121	394	8.8	63.3	15	19.1	7.7	46.2	47.2
	Median	0.2	2.5	—	—	—	—	—	10.2	13.2	117	416	8.9	64.5	12	19.1	7.8	47.2	47.9
	Minimum	0.2	0.8	—	—	—	—	—	9	11.3	106	257	8.5	45	10	15.4	6.7	43.4	0
	Maximum	0.2	4.6	—	—	—	—	—	13.1	17.2	158	479	9.1	83	25	22.2	8.2	48	79.6
	Std. dev.	0	1.05	—	—	—	—	—	0.97	1.47	13.3	69.2	0.16	10.3	5.46	2.54	0.46	2.45	16.3
	N obs.	30	30	0	0	0	0	0	30	30	30	30	29	30	30	8	8	3	30
3. Backwater	Mean	0.2	1.37	0.13	—	—	—	—	12.3	14.3	133	357	9	58.1	17	23.7	10.1	72.6	69.8
	Median	0.2	1.25	0.09	—	—	—	—	12.2	13.2	123	341	8.9	60	14	22.7	7.7	78.6	66.9
	Minimum	0.2	0.3	0	—	—	—	—	9.8	10.5	101	190	8.4	21	9	11.6	4.7	48.2	0
	Maximum	0.2	3.6	0.58	—	—	—	—	15.1	20	198	475	9.7	90	53	42.2	17.4	90.9	150
	Std. dev.	0	0.65	0.12	—	—	—	—	1.57	2.81	26.7	93.4	0.3	14.8	9.09	10.8	5.31	22	31.8
	N obs.	50	50	41	0	0	0	0	50	50	50	50	49	47	50	6	6	3	50
4. Lake	Mean	0.2	7.39	—	—	—	—	—	11.1	14.4	131	451	8.8	63.5	17	20.7	7.4	65.5	56.5
	Median	0.2	7.9	—	—	—	—	—	11	13.5	122	456	8.8	60.5	17	20.7	7.3	59.9	55.1
	Minimum	0.2	2.4	—	—	—	—	—	9.9	11.4	101	337	8.5	48	8	13.8	6.3	53.5	25.1
	Maximum	0.2	11.1	—	—	—	—	—	13.5	19	172	478	9.1	84	24	33.5	8.7	83.3	92.8
	Std. dev.	0	2.28	—	—	—	—	—	0.76	2.32	22.5	28.8	0.2	11.7	5.95	5.24	0.82	15.7	17.3
	N obs.	30	30	0	0	0	0	0	30	30	30	30	30	30	30	14	14	3	30
1994 Near-bottom measurements: spring																			
3. Backwater	Mean	1.21	1.41	—	—	—	—	—	12	13.7	127	—	—	—	—	—	—	—	—
	Median	1.1	1.3	—	—	—	—	—	11.9	13.1	119	—	—	—	—	—	—	—	—
	Minimum	0.3	0.5	—	—	—	—	—	8.8	10.4	92	—	—	—	—	—	—	—	—
	Maximum	3.4	3.6	—	—	—	—	—	14.9	20	198	—	—	—	—	—	—	—	—
	Std. dev.	0.63	0.63	—	—	—	—	—	1.67	2.31	22	—	—	—	—	—	—	—	—
	N obs.	48	48	0	—	—	—	—	48	48	48	0	0	—	0	0	0	0	0

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1994 Near-bottom measurements: spring																			
4. Lake	Mean	7.19	7.39	—	—	—	—	—	10.4	12.5	112	—	—	—	—	—	—	—	—
	Median	7.7	7.9	—	—	—	—	—	10.3	12.1	109	—	—	—	—	—	—	—	—
	Minimum	2.2	2.4	—	—	—	—	—	9.5	11.3	100	—	—	—	—	—	—	—	—
	Maximum	10.9	11.1	—	—	—	—	—	11.1	15.4	136	—	—	—	—	—	—	—	—
	Std. dev.	2.28	2.28	—	—	—	—	—	0.52	0.95	8.17	—	—	—	—	—	—	—	—
	N obs.	30	30	0	—	—	—	—	30	30	30	0	0	—	0	0	0	0	0
1994 Near-surface measurements: summer																			
1. Main channel	Mean	0.2	4.44	—	—	—	—	—	24.1	7.35	88	447	8.3	63.1	24	25.7	5.6	25.8	29.1
	Median	0.2	4.1	—	—	—	—	—	24.1	7.4	88	470	8.3	74	14	11.5	5.2	25.8	25.5
	Minimum	0.2	0.98	—	—	—	—	—	23.1	6.4	76	207	8.1	29	9	3.6	-0.1	25.8	18.8
	Maximum	0.2	12.5	—	—	—	—	—	24.8	8.5	100	520	8.5	95	47	73.4	14.6	25.8	48.6
	Std. dev.	0	2.39	—	—	—	—	—	0.42	0.6	6.96	64.2	0.09	24	14.4	22.3	3.22	—	8.22
	N obs.	25	25	0	0	0	0	0	25	25	25	25	25	25	25	25	25	1	25
2. Side channel	Mean	0.2	2.15	—	—	—	—	—	24.5	7.92	96	418	8.4	55	23	25	6.3	30.2	36.8
	Median	0.2	2	—	—	—	—	—	24.4	7.8	94	442	8.4	44	14	13.8	5.6	26.8	31.8
	Minimum	0.2	0.28	—	—	—	—	—	23.6	6.9	82	285	8.2	25	10	8.3	1.5	19.8	18.4
	Maximum	0.2	6.7	—	—	—	—	—	26	10.5	128	492	8.9	105	45	58.1	12.8	47.5	103
	Std. dev.	0	1.54	—	—	—	—	—	0.62	0.79	9.96	59.4	0.13	24.1	12.9	17.1	2.68	12.3	17.8
	N obs.	30	30	0	0	0	0	0	30	30	30	30	30	23	30	30	30	4	30
3. Backwater	Mean	0.2	1	0.08	—	—	—	—	25.8	9.67	120	408	8.5	45.9	28	33.7	8.3	54.8	53.1
	Median	0.2	0.97	0.04	—	—	—	—	25.2	9	110	412	8.5	45	25	26.7	6.8	38	42.5
	Minimum	0.2	0.23	0	—	—	—	—	23.4	4.3	56	273	7.8	22	11	6.1	-0.1	17.3	9.22
	Maximum	0.2	2.3	0.57	—	—	—	—	28.2	20	258	499	9.3	78	80	172	32.7	126	147
	Std. dev.	0	0.5	0.11	—	—	—	—	1.45	3.37	43.8	63.9	0.28	15	15.3	26.9	6.23	48.8	33.4
	N obs.	49	49	46	0	0	0	0	49	49	49	49	49	39	49	49	49	4	49
4. Lake	Mean	0.2	6.02	—	—	—	—	—	25	8.48	104	486	8.4	60.5	18	16	5.3	26.3	30.3
	Median	0.2	7.2	—	—	—	—	—	25	8.2	100	487	8.4	53	19	16.6	5.2	28.1	29.4
	Minimum	0.2	1.2	—	—	—	—	—	23	6.2	74	466	8.2	40	8	3.3	0.3	9.36	4.48
	Maximum	0.2	9.5	—	—	—	—	—	27.1	13.5	168	512	8.8	89	32	36.8	9.2	39.7	72.2
	Std. dev.	0	2.73	—	—	—	—	—	0.79	1.83	23.6	10.5	0.17	15.8	6.64	7.96	1.98	14.7	17.6
	N obs.	31	31	0	0	0	0	0	31	31	31	31	31	31	31	31	31	4	31

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1994 Near-bottom measurements: summer																			
3. Backwater	Mean	0.95	1.16	—	—	—	—	—	24.8	8.15	99	—	—	—	—	—	—	—	—
	Median	0.8	1.06	—	—	—	—	—	24.9	8.1	98	—	—	—	—	—	—	—	—
	Minimum	0.4	0.56	—	—	—	—	—	23.1	4.8	57	—	—	—	—	—	—	—	—
	Maximum	2.1	2.3	—	—	—	—	—	27.1	18.9	239	—	—	—	—	—	—	—	—
	Std. dev.	0.44	0.45	—	—	—	—	—	1.09	2.31	29.9	—	—	—	—	—	—	—	—
	N obs.	38	38	0	—	—	—	—	38	38	38	0	0	—	0	0	0	0	0
4. Lake	Mean	5.82	6.02	—	—	—	—	—	23.4	5.62	67	—	—	—	—	—	—	—	—
	Median	7	7.2	—	—	—	—	—	23.2	5.8	68	—	—	—	—	—	—	—	—
	Minimum	1	1.2	—	—	—	—	—	22.3	3.5	41	—	—	—	—	—	—	—	—
	Maximum	9.3	9.5	—	—	—	—	—	25	8.1	99	—	—	—	—	—	—	—	—
	Std. dev.	2.73	2.73	—	—	—	—	—	0.67	1.25	15.6	—	—	—	—	—	—	—	—
	N obs.	31	31	0	—	—	—	—	31	31	31	0	0	—	0	0	0	0	0
1994 Near-surface measurements: fall																			
1. Main channel	Mean	0.2	4.32	—	—	—	—	—	13.4	9.32	89	449	8.1	51.5	21	24.1	6.3	15.8	15.6
	Median	0.2	4.2	—	—	—	—	—	13.4	9.5	90	496	8.1	56	17	14.8	5.2	15.8	16.1
	Minimum	0.2	0.79	—	—	—	—	—	12.1	8.8	84	139	7.7	27	8	9.4	3.2	9.98	7.43
	Maximum	0.2	9.1	—	—	—	—	—	14.2	10	94	537	8.2	77	33	48.8	11	21.5	24.9
	Std. dev.	0	2.29	—	—	—	—	—	0.48	0.35	2.97	111	0.13	18	8.57	14.7	2.71	8.16	6.56
	N obs.	25	25	0	0	0	0	0	25	25	25	25	25	24	25	25	25	2	25
2. Side channel	Mean	0.2	2.17	0.27	—	—	—	—	13.4	9.42	90	431	8.1	49	22	24.6	6.6	12	14.2
	Median	0.2	2	0.27	—	—	—	—	13.5	9.5	91	490	8.2	51	20	16.1	4.9	10.1	10.9
	Minimum	0.2	0.33	0.21	—	—	—	—	12.2	8.8	83	225	7.9	25	11	7.8	3	8.42	6.71
	Maximum	0.2	6.7	0.33	—	—	—	—	14.9	10.3	102	540	8.3	72	35	48.8	12.1	19.7	32.1
	Std. dev.	0	1.63	0.08	—	—	—	—	0.66	0.34	3.6	116	0.11	16.2	8.82	15.5	3.22	5.22	7.09
	N obs.	32	32	2	0	0	0	0	32	32	32	32	32	29	32	32	32	4	32
3. Backwater	Mean	0.2	1.04	0.07	—	—	—	—	13.3	9.79	94	360	8.1	48.9	23	28.3	7.3	18.9	20.1
	Median	0.2	1.01	0.05	—	—	—	—	13.3	9.6	93	279	8	50	17	18.5	5.6	10.2	11
	Minimum	0.2	0.35	0	—	—	—	—	10.2	8.3	75	208	7.6	14	7	8.6	3.2	9.09	7.69
	Maximum	0.2	3.8	0.22	—	—	—	—	15.3	14.3	133	623	9	90	74	109	18.3	46.2	107
	Std. dev.	0	0.61	0.05	—	—	—	—	1.04	1.19	11.2	136	0.29	20.5	15.8	21.6	3.87	18.2	20
	N obs.	47	47	44	0	0	0	0	47	47	47	47	47	38	47	47	47	4	47

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1994 Near-surface measurements: fall																			
4. Lake	Mean	0.2	6.66	—	—	—	—	—	14.2	9.59	94	512	8.2	56.4	19	17.7	5.8	11.7	17.3
	Median	0.2	7.7	—	—	—	—	—	14.3	9.6	94	517	8.2	59	17	15.2	5.4	10.6	16.4
	Minimum	0.2	1.01	—	—	—	—	—	13.1	8.6	82	488	8.1	34	11	-0.1	3.6	10.1	7.35
	Maximum	0.2	12.9	—	—	—	—	—	15.5	10.2	101	536	8.3	81	35	46.8	10	14.4	33
	Std. dev.	0	2.95	—	—	—	—	—	0.73	0.41	4.35	14.7	0.07	12.3	6.36	9.74	1.82	2.32	6.72
	N obs.	31	31	0	0	0	0	0	31	31	31	31	31	31	31	31	31	3	31
1994 Near-bottom measurements: fall																			
2. Side channel	Mean	1.7	1.9	—	—	—	—	—	13.3	9.3	89	331	8.1	—	—	—	—	—	—
	Median	1.7	1.9	—	—	—	—	—	13.3	9.3	89	331	8.1	—	—	—	—	—	—
	Minimum	1.7	1.9	—	—	—	—	—	13.3	9.3	89	331	8.1	—	—	—	—	—	—
	Maximum	1.7	1.9	—	—	—	—	—	13.3	9.3	89	331	8.1	—	—	—	—	—	—
	Std. dev.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	N obs.	1	1	0	—	—	—	—	1	1	1	1	1	—	0	0	0	0	0
3. Backwater	Mean	1.03	1.24	—	—	—	—	—	13.1	9.65	92	376	8.1	—	—	—	—	—	—
	Median	0.9	1.1	—	—	—	—	—	13	9.5	91	355	8.2	—	—	—	—	—	—
	Minimum	0.4	0.62	—	—	—	—	—	11.1	8.4	77	210	7.6	—	—	—	—	—	—
	Maximum	3.6	3.8	—	—	—	—	—	15	13.1	124	540	8.8	—	—	—	—	—	—
	Std. dev.	0.6	0.6	—	—	—	—	—	0.91	1.05	10.1	135	0.26	—	—	—	—	—	—
	N obs.	34	34	0	—	—	—	—	34	34	34	34	34	—	0	0	0	0	0
4. Lake	Mean	6.5	6.66	—	—	—	—	—	13.4	8.96	86	513	8.2	—	—	—	—	—	—
	Median	7.5	7.7	—	—	—	—	—	13.3	8.9	85	518	8.2	—	—	—	—	—	—
	Minimum	0.8	1.01	—	—	—	—	—	12.9	8.4	80	489	8.1	—	—	—	—	—	—
	Maximum	12.7	12.9	—	—	—	—	—	13.9	10.1	97	535	8.3	—	—	—	—	—	—
	Std. dev.	2.98	2.95	—	—	—	—	—	0.28	0.4	3.92	14.3	0.06	—	—	—	—	—	—
	N obs.	31	31	0	—	—	—	—	31	31	31	31	31	—	0	0	0	0	0
1995 Near-surface measurements: winter																			
1. Main channel	Mean	0.2	4.07	—	66.7	14	30	2	1.22	14.1	100	506	7.8	206	4	2.8	1.9	8.61	11
	Median	0.2	3.9	—	50	2	0	2	1.1	14	100	503	7.8	210	4	2.6	1.9	7.86	15
	Minimum	0.2	1.55	—	50	1	0	2	0.1	13.4	92	433	7.7	108	2	1.7	0.8	1.87	2.84
	Maximum	0.2	7.9	—	100	40	90	2	2.2	16.5	115	573	8.1	266	7	5.8	2.9	16.8	20.7
	Std. dev.	0	1.72	—	28.9	22.2	52	—	0.56	0.59	3.86	37.6	0.11	39.1	1.14	0.86	0.43	6.83	7.1
	N obs.	25	25	0	3	3	3	1	25	25	25	25	25	23	25	25	25	4	25

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1995 Near-surface measurements: winter																			
2. Side channel	Mean	0.2	1.71	—	96.7	14	37	11	1.03	14.4	101	496	7.8	172	4	3.2	1.9	10.7	14.3
	Median	0.2	1.44	—	100	13	15	2	0.9	14.6	103	503	7.8	190	4	2.7	1.8	14	17.1
	Minimum	0.2	0.4	—	90	1	0	1	0	10.7	73	358	7.4	137	2	1.4	1.2	3.74	0
	Maximum	0.2	5	—	100	29	100	50	2.3	15.8	112	552	8.1	205	9	10.7	2.7	14.3	26.3
	Std. dev.	0	1.07	—	5.16	12.1	45.4	22	0.54	0.89	6.51	39.6	0.12	29.4	1.45	1.89	0.36	6.01	7.84
	N obs.	30	30	0	6	6	6	5	30	30	30	30	30	9	30	30	30	3	30
3. Backwater	Mean	0.2	1.05	0.03	95.2	35	70	3	0.84	13.9	97	488	7.8	119	5	4.8	2.8	13.7	24.3
	Median	0.2	0.82	0.03	100	38	80	2	0.4	14.4	100	491	7.9	132	4	3.2	2.4	16	18.4
	Minimum	0.2	0.31	0	10	2	0	1	0.1	0.6	4	322	6.9	42	3	1.5	1.3	2.99	2.11
	Maximum	0.2	3.55	0.06	100	48	100	7	4.7	20	139	843	8.3	164	12	23.3	10.9	22.1	259
	Std. dev.	0	0.78	0.02	17.9	10.3	31.9	1.3	1.13	3.33	23.3	79.7	0.31	42.7	2.72	4.06	1.72	9.76	41.6
	N obs.	35	35	25	33	33	33	33	35	35	35	35	35	8	35	35	35	3	35
4. Lake	Mean	0.2	5.51	—	100	41	63	2	0.9	15.3	107	552	8	159	4	3.3	2.8	20.8	32.9
	Median	0.2	5.5	—	100	43	50	2	0.9	15.1	105	554	8	159	3	2.5	2.3	16.1	23.4
	Minimum	0.2	1.7	—	100	21	40	1	0.3	11	77	490	7.5	32	2	1	1.3	12.3	3.48
	Maximum	0.2	9.8	—	100	51	100	3	1.9	20	141	584	9.1	254	18	15.2	12.8	33.9	276
	Std. dev.	0	2.43	—	0	6.48	20.1	.33	0.35	1.82	12.8	20.9	0.27	43	2.88	2.49	2.17	11.5	49
	N obs.	31	31	0	30	30	30	29	31	31	31	31	31	30	31	31	31	3	31
1995 Near-bottom measurements: winter																			
3. Backwater	Mean	1.33	1.54	—	—	—	—	—	1.06	13.4	94	479	7.7	—	—	—	—	—	—
	Median	0.8	1.05	—	—	—	—	—	0.6	14.2	97	494	7.9	—	—	—	—	—	—
	Minimum	0.6	0.82	—	—	—	—	—	0.1	5	36	326	6.7	—	—	—	—	—	—
	Maximum	3.4	3.55	—	—	—	—	—	4.8	16.3	113	543	7.9	—	—	—	—	—	—
	Std. dev.	0.89	0.88	—	—	—	—	—	1.22	2.54	17	50.4	0.29	—	—	—	—	—	—
	N obs.	17	17	0	—	—	—	—	17	17	17	17	17	—	0	0	0	0	0
4. Lake	Mean	5.31	5.51	—	—	—	—	—	1.82	13.4	96	560	7.8	—	—	—	—	—	—
	Median	5.3	5.5	—	—	—	—	—	1.8	12.8	92	568	7.7	—	—	—	—	—	—
	Minimum	1.5	1.7	—	—	—	—	—	0.7	9.3	68	520	7.5	—	—	—	—	—	—
	Maximum	9.6	9.8	—	—	—	—	—	2.5	23.1	169	591	8.5	—	—	—	—	—	—
	Std. dev.	2.43	2.43	—	—	—	—	—	0.44	3.37	24.1	18.8	0.25	—	—	—	—	—	—
	N obs.	31	31	0	—	—	—	—	31	31	31	31	31	—	0	0	0	0	0

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1995 Near-surface measurements: spring																			
1. Main channel	Mean	0.2	5	—	—	—	—	—	10.1	13.5	120	509	8.5	63.5	14	22.6	6.6	41.7	43.4
	Median	0.2	4.4	—	—	—	—	—	10	13.6	119	537	8.5	67	10	14.9	6.2	41.7	43.7
	Minimum	0.2	0.35	—	—	—	—	—	8.7	12.2	105	293	8.3	38	8	11.2	4	41.7	29.2
	Maximum	0.2	10.7	—	—	—	—	—	11.2	15.1	138	571	8.6	91	24	38.1	10	41.7	56.1
	Std. dev.	0	2.64	—	—	—	—	—	0.8	0.88	9.6	65.3	0.1	16.6	6.06	11.5	1.77	—	6.84
	N obs.	25	25	0	0	0	0	0	25	25	25	25	25	23	25	24	24	1	25
2. Side channel	Mean	0.2	2.71	0.21	—	—	—	—	10.3	13.9	124	479	8.5	69.1	13	20.7	6.3	28.3	43
	Median	0.2	2.9	0.21	—	—	—	—	10.3	13.8	123	487	8.5	75	10	13.7	6.1	28.3	39.3
	Minimum	0.2	0.66	0.21	—	—	—	—	8.6	11.4	101	263	8.1	41	7	10.6	4.4	21.4	24.1
	Maximum	0.2	5.8	0.21	—	—	—	—	12.8	17.7	167	560	8.8	102	24	40.6	8.8	35.3	73.1
	Std. dev.	0	1.53	—	—	—	—	—	1.19	1.81	19.6	82	0.18	19.2	6.67	11.8	1.32	9.83	13.3
	N obs.	30	30	1	0	0	0	0	30	30	30	30	30	26	30	30	30	2	30
3. Backwater	Mean	0.2	1.65	0.11	—	—	—	—	10.4	13.9	124	417	8.4	67.8	10	15.7	5.5	32.3	38
	Median	0.2	1.4	0.08	—	—	—	—	10.2	13.5	118	476	8.5	67	9	13.6	5.5	31.7	39.9
	Minimum	0.2	0.55	0	—	—	—	—	8.5	10	91	137	7.4	42	3	4	2.6	19.3	11.5
	Maximum	0.2	3.7	0.44	—	—	—	—	14.3	20.1	196	572	8.9	96	22	44.4	8.7	49.4	74.1
	Std. dev.	0	0.78	0.1	—	—	—	—	1.19	2.38	24	139	0.45	15	4.48	9.17	1.5	10.4	14.3
	N obs.	50	50	48	0	0	0	0	50	50	50	50	50	41	50	50	50	7	50
4. Lake	Mean	0.2	7.26	—	—	—	—	—	10.3	15.3	136	503	8.6	68.4	10	13.2	5.5	36.3	39.4
	Median	0.2	7.7	—	—	—	—	—	9.8	15.4	136	506	8.6	64.5	9	10.9	5.3	36.3	38.6
	Minimum	0.2	2.1	—	—	—	—	—	8	12.4	109	305	8.4	46	6	7.5	3.4	26.2	29
	Maximum	0.2	11.4	—	—	—	—	—	13	18.2	170	564	8.9	88	19	33.3	9.8	46.4	51.9
	Std. dev.	0	2.63	—	—	—	—	—	1.3	1.52	16.4	46.1	0.14	10.4	3.45	6.22	1.42	14.3	6.62
	N obs.	30	30	0	0	0	0	0	30	30	30	30	30	30	30	30	30	2	30
1995 Near-bottom measurements: spring																			
2. Side channel	Mean	0.5	0.67	—	—	—	—	—	12.9	17.8	169	548	8.8	—	—	—	—	—	—
	Median	0.5	0.67	—	—	—	—	—	12.9	17.8	169	548	8.8	—	—	—	—	—	—
	Minimum	0.5	0.67	—	—	—	—	—	12.9	17.8	169	548	8.8	—	—	—	—	—	—
	Maximum	0.5	0.67	—	—	—	—	—	12.9	17.8	169	548	8.8	—	—	—	—	—	—
	Std. dev.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	N obs.	1	1	0	—	—	—	—	1	1	1	1	1	—	0	0	0	0	0

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1995 Near-bottom measurements: spring																			
3. Backwater	Mean	1.41	1.62	—	—	—	—	—	10.2	13.6	122	412	8.3	—	—	—	—	—	—
	Median	1.15	1.4	—	—	—	—	—	10.2	13.4	117	468	8.4	—	—	—	—	—	—
	Minimum	0.4	0.55	—	—	—	—	—	8.3	10	91	137	7.3	—	—	—	—	—	—
	Maximum	3.4	3.6	—	—	—	—	—	14	19.5	189	566	8.9	—	—	—	—	—	—
	Std. dev.	0.74	0.73	—	—	—	—	—	1.2	2.33	23.5	140	0.47	—	—	—	—	—	—
	N obs.	48	48	0	—	—	—	—	48	48	48	48	48	—	0	0	0	0	0
4. Lake	Mean	7.03	7.26	—	—	—	—	—	8.12	13.1	111	514	8.4	—	—	—	—	—	—
	Median	7.5	7.7	—	—	—	—	—	7.7	13	110	509	8.4	—	—	—	—	—	—
	Minimum	1.9	2.1	—	—	—	—	—	7.1	12.2	102	472	8.3	—	—	—	—	—	—
	Maximum	11.2	11.4	—	—	—	—	—	9.8	14.8	127	564	8.5	—	—	—	—	—	—
	Std. dev.	2.59	2.63	—	—	—	—	—	0.9	0.48	4.45	22.9	0.06	—	—	—	—	—	—
	N obs.	30	30	0	—	—	—	—	30	30	30	30	30	—	0	0	0	0	0
1995 Near-surface measurements: summer																			
1. Main channel	Mean	0.2	3.73	—	—	—	—	—	25.8	6.66	83	541	8.1	62.1	26	33.3	8.1	16.7	14.2
	Median	0.2	3.8	—	—	—	—	—	25.7	6.7	83	546	8	77.5	10	10.6	6.2	16.7	15
	Minimum	0.2	1.28	—	—	—	—	—	25.1	5.9	73	411	8	18	6	6	3.2	16.7	7.5
	Maximum	0.2	6.4	—	—	—	—	—	26.6	7.6	95	600	8.2	108	60	84.3	15.3	16.7	22.3
	Std. dev.	0	1.57	—	—	—	—	—	0.39	0.44	5.54	52.8	0.07	35.6	21.9	30.3	4.08	—	4.59
	N obs.	24	24	0	0	0	0	0	24	24	24	24	24	24	24	24	24	1	22
2. Side channel	Mean	0.2	2.36	—	—	—	—	—	25.9	7.11	88	526	8.1	51.8	26	32.5	7.1	16.8	16.2
	Median	0.2	2.2	—	—	—	—	—	25.8	7.1	89	550	8.1	55.5	11	13.9	5.6	16	17.7
	Minimum	0.2	0.35	—	—	—	—	—	25	5.8	71	392	8	18	7	5.6	-0.1	12.8	6.3
	Maximum	0.2	7.3	—	—	—	—	—	27.4	8.8	111	597	8.3	103	62	87.4	15.9	22.2	22.9
	Std. dev.	0	1.47	—	—	—	—	—	0.55	0.64	7.91	62.5	0.08	30.3	22.3	29.6	3.76	3.77	5.51
	N obs.	30	30	0	0	0	0	0	30	30	30	30	30	26	30	30	30	6	28
3. Backwater	Mean	0.2	0.87	0.05	—	—	—	—	26.4	9.19	116	463	8.3	39.2	23	31.8	9.2	18.6	35.1
	Median	0.2	0.71	0.03	—	—	—	—	26.1	8.1	100	453	8.2	39	16	22.9	8.7	20.1	27.3
	Minimum	0.2	0.3	0	—	—	—	—	24.7	5.3	67	288	7.6	17	8	8.9	3.9	6.42	7.89
	Maximum	0.2	2.65	0.27	—	—	—	—	29.4	25	327	589	8.8	81	83	106	18.1	27.8	150
	Std. dev.	0	0.49	0.05	—	—	—	—	1.06	4.32	57	92.6	0.26	16.6	15.9	22.5	3.19	8.96	24.9
	N obs.	50	50	45	0	0	0	0	50	50	50	50	50	39	50	50	50	4	47

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1995 Near-surface measurements: summer																			
4. Lake	Mean	0.2	7.07	—	—	—	—	—	26.4	8.28	104	575	8.3	61.6	14	13.9	5.2	26.1	24.8
	Median	0.2	7.55	—	—	—	—	—	26.3	8.2	104	579	8.3	60	10	11	4.7	26.1	23.3
	Minimum	0.2	1.3	—	—	—	—	—	25.6	6.6	82	545	8.1	20	6	5	2.4	15.4	13.3
	Maximum	0.2	9.99	—	—	—	—	—	28	11.3	145	603	8.6	98	41	47.3	13.3	36.9	51.5
	Std. dev.	0	2.36	—	—	—	—	—	0.6	1.3	17.3	15.9	0.14	23.3	9.86	9.86	2.17	15.2	9.51
	N obs.	30	30	0	0	0	0	0	30	30	30	30	30	30	29	30	30	2	30
1995 Near-bottom measurements: summer																			
3. Backwater	Mean	0.89	1.1	—	—	—	—	—	26.1	7.63	95	473	8.1	—	—	—	—	—	—
	Median	0.85	1.05	—	—	—	—	—	26	7.45	93	478	8.2	—	—	—	—	—	—
	Minimum	0.4	0.55	—	—	—	—	—	24.4	0.2	2	288	7.2	—	—	—	—	—	—
	Maximum	2.4	2.65	—	—	—	—	—	29.4	25	319	588	8.6	—	—	—	—	—	—
	Std. dev.	0.45	0.47	—	—	—	—	—	1.13	3.87	49.9	99.2	0.25	—	—	—	—	—	—
	N obs.	28	28	0	—	—	—	—	28	28	28	28	28	—	0	0	0	0	0
4. Lake	Mean	6.86	7.07	—	—	—	—	—	25.5	5.82	72	577	8	—	—	—	—	—	—
	Median	7.35	7.55	—	—	—	—	—	25.5	5.7	70	580	8	—	—	—	—	—	—
	Minimum	1.1	1.3	—	—	—	—	—	24.6	2.3	28	550	7.7	—	—	—	—	—	—
	Maximum	9.7	9.99	—	—	—	—	—	27.4	10.7	137	604	8.5	—	—	—	—	—	—
	Std. dev.	2.36	2.36	—	—	—	—	—	0.5	1.37	17.7	14.8	0.14	—	—	—	—	—	—
	N obs.	30	30	0	—	—	—	—	30	30	30	30	30	—	0	0	0	0	0
1995 Near-surface measurements: fall																			
1. Main channel	Mean	0.2	5.05	—	—	—	—	—	14.2	9.23	90	418	8.1	49.3	23	34.4	7.1	7.4	15
	Median	0.2	4.9	—	—	—	—	—	14.4	9.3	90	428	8.1	53	17	20.5	6.5	6.95	15.1
	Minimum	0.2	2.3	—	—	—	—	—	13.3	8.7	85	266	7.8	31	10	7.8	2.9	5.7	9.89
	Maximum	0.2	10.7	—	—	—	—	—	15.7	9.5	96	463	8.2	78	42	70.7	10.5	9.98	18.4
	Std. dev.	0	2.16	—	—	—	—	—	0.59	0.24	2.13	44.9	0.09	15.8	12.1	23.4	2.58	1.87	2.13
	N obs.	24	24	0	0	0	0	0	24	24	24	24	24	24	24	24	24	4	23
2. Side channel	Mean	0.2	2.85	0.43	—	—	—	—	14.1	9.36	91	369	8	50.7	18	26.2	6.1	3.21	12.8
	Median	0.2	2.85	0.46	—	—	—	—	14.4	9.4	90	422	8	51	14	16.6	5.6	3.21	13.1
	Minimum	0.2	0.25	0.04	—	—	—	—	11.5	8.7	85	153	7.5	25	8	8.2	3.3	3.21	6.73
	Maximum	0.2	5.8	0.76	—	—	—	—	15.9	10.2	100	462	8.2	80	37	63.5	10	3.21	19.7
	Std. dev.	0	1.46	0.18	—	—	—	—	1.08	0.38	3.74	99.3	0.15	15.7	9.13	17.8	2.05	—	3.22
	N obs.	32	32	31	0	0	0	0	32	32	32	32	32	30	32	32	32	1	32

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1995 Near-surface measurements: fall																			
3. Backwater	Mean	0.2	1.13	0.07	—	—	—	—	14	9.62	93	317	7.9	53.7	16	22.1	6.1	8.8	15.4
	Median	0.2	1.2	0.05	—	—	—	—	14.4	9.4	92	276	8	54	14	17.4	5.5	6.72	12.9
	Minimum	0.2	0.32	0	—	—	—	—	10.2	7.7	73	137	7.2	28	4	3	2.1	5.35	2.66
	Maximum	0.2	2.5	0.37	—	—	—	—	17.9	14.1	142	465	8.7	90	50	108	15.7	18.2	57.9
	Std. dev.	0	0.5	0.07	—	—	—	—	2.05	1.35	14	116	0.33	16.7	9.81	19.5	3.04	5.29	11.3
	N obs.	49	49	49	0	0	0	0	49	49	49	49	49	39	49	49	49	5	49
4. Lake	Mean	0.2	6.59	—	—	—	—	—	15.4	9.64	97	434	8.2	51.2	14	14.4	5.4	6.68	13.1
	Median	0.2	7.8	—	—	—	—	—	15.8	9.6	98	427	8.1	50	14	14.4	4.8	4.99	12.8
	Minimum	0.2	1.4	—	—	—	—	—	13.6	8.7	84	411	8	33	8	7.2	3.5	3.21	8.22
	Maximum	0.2	11.7	—	—	—	—	—	18.4	11.9	124	466	8.6	70	18	21.8	8.4	11.8	18.2
	Std. dev.	0	2.67	—	—	—	—	—	1.41	0.67	9.17	16.6	0.14	8.87	2.7	3.8	1.61	4.55	2.52
	N obs.	31	31	0	0	0	0	0	31	31	31	31	31	31	31	31	31	3	31
1995 Near-bottom measurements: fall																			
3. Backwater	Mean	1.03	1.24	—	—	—	—	—	13.5	9.15	88	320	7.9	—	—	—	—	—	—
	Median	1.1	1.28	—	—	—	—	—	13.5	9.2	90	268	8	—	—	—	—	—	—
	Minimum	0.4	0.55	—	—	—	—	—	9.4	5.6	53	137	7.2	—	—	—	—	—	—
	Maximum	2.3	2.5	—	—	—	—	—	17.5	11.5	107	496	8.6	—	—	—	—	—	—
	Std. dev.	0.44	0.44	—	—	—	—	—	2.12	0.92	9.07	117	0.32	—	—	—	—	—	—
	N obs.	43	43	0	—	—	—	—	43	43	43	43	43	—	0	0	0	0	0
4. Lake	Mean	6.48	6.68	—	—	—	—	—	13.5	8.77	84	432	8	—	—	—	—	—	—
	Median	7.65	7.85	—	—	—	—	—	13.4	8.7	83	427	8	—	—	—	—	—	—
	Minimum	1.2	1.4	—	—	—	—	—	13	7.9	76	416	7.9	—	—	—	—	—	—
	Maximum	11.5	11.7	—	—	—	—	—	14.8	10.6	102	464	8.3	—	—	—	—	—	—
	Std. dev.	2.67	2.67	—	—	—	—	—	0.37	0.55	5.56	14.9	0.11	—	—	—	—	—	—
	N obs.	30	30	0	—	—	—	—	30	30	30	30	30	—	0	0	0	0	0
1996 Near-surface measurements: winter																			
1. Main channel	Mean	0.2	4.69	—	95.8	24	70	9	0.42	11.1	77	531	7.6	185	3	2.5	1.4	-1	0
	Median	0.2	4.3	—	100	28	100	10	0.5	11.4	79	523	7.6	171	3	2.4	1.4	-1	0
	Minimum	0.2	1.32	—	80	3	0	0	0	9.9	68	372	7.4	112	2	1.4	1	-1	0
	Maximum	0.2	8.8	—	100	40	100	19	0.8	12.2	85	608	7.7	251	4	3.3	1.9	-1	0
	Std. dev.	0	1.97	—	7.93	13.3	44.5	6.3	0.31	0.85	6.48	58.8	0.06	43.6	0.7	0.52	0.24	0	0
	N obs.	25	25	0	12	12	12	10	25	25	25	25	25	23	25	25	25	3	24

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1996 Near-surface measurements: winter																			
2. Side channel	Mean	0.2	2.33	0.14	99.6	28	94	8	0.14	10.4	71	489	7.5	137	4	3	1.5	-.19	0.14
	Median	0.2	1.77	0.13	100	29	100	8	0.1	10.2	70	500	7.6	130	3	2.1	1.3	-1	0
	Minimum	0.1	0.35	0.01	90	14	50	2	0	8.9	61	362	7.3	50	2	1.2	1	-1	0
	Maximum	0.2	5.2	0.35	100	40	100	18	0.9	12.3	86	611	7.7	196	25	26.3	7	1.43	4.11
	Std. dev.	0.02	1.38	0.08	2	8.34	13.6	3.9	0.21	0.88	6.46	77.9	0.1	37.2	4.1	4.55	1.08	1.4	0.76
	N obs.	29	29	28	25	25	25	25	29	29	29	29	29	17	29	29	29	3	29
3. Backwater	Mean	0.2	1.11	0.04	99	49	95	15	0.47	9.54	66	476	7.5	95.6	5	4	1.6	0.33	0.42
	Median	0.2	1.05	0.03	100	50	100	15	0.1	9.6	66	506	7.5	88	4	2.6	1.4	-1	0
	Minimum	0.2	0.28	0	80	6	10	2	0	4.3	30	296	7.1	46	2	1.2	0.8	-1	0
	Maximum	0.2	2.7	0.18	100	62	100	29	4.4	14.2	99	624	7.9	179	16	15.4	3.2	2.99	3.89
	Std. dev.	0	0.49	0.04	3.96	11.2	18.1	7.4	0.99	2.08	15.5	105	0.19	38.3	3.33	3.8	0.58	2.3	1.14
	N obs.	35	35	32	31	31	31	30	35	35	35	35	35	14	34	34	34	3	31
4. Lake	Mean	0.2	6.52	—	100	61	98	9	0.08	10.8	74	541	7.6	185	5	2.1	1.2	-1	0.02
	Median	0.2	7.4	—	100	60	100	9	0.1	10.7	73	540	7.5	198	5	1.8	1.1	-1	0
	Minimum	0.2	0.83	—	100	40	80	3	0	9.3	64	506	7.4	18	2	1.2	0.8	-1	0
	Maximum	0.2	10.9	—	100	74	100	17	0.2	12.6	87	606	8.1	253	9	7.7	2.9	-1	0.69
	Std. dev.	0	2.66	—	0	7.58	4.61	3.9	0.07	0.56	3.9	25.5	0.12	44.3	2.1	1.22	0.41	0	0.13
	N obs.	30	30	0	30	30	30	30	30	30	30	30	30	27	30	30	30	4	30
1996 Near-bottom measurements: winter																			
3. Backwater	Mean	1.08	1.3	—	—	—	—	—	0.4	9.3	64	483	7.5	—	—	—	—	—	—
	Median	1	1.19	—	—	—	—	—	0.1	9.35	64	520	7.5	—	—	—	—	—	—
	Minimum	0.4	0.66	—	—	—	—	—	0	4.7	33	298	7.1	—	—	—	—	—	—
	Maximum	2.5	2.7	—	—	—	—	—	4.4	12.9	99	624	7.8	—	—	—	—	—	—
	Std. dev.	0.49	0.48	—	—	—	—	—	0.91	2	14.9	101	0.18	—	—	—	—	—	—
	N obs.	24	24	0	—	—	—	—	24	24	24	24	24	—	0	0	0	0	0
4. Lake	Mean	6.52	6.72	—	—	—	—	—	0.54	9.91	69	555	7.5	—	—	—	—	—	—
	Median	7.3	7.5	—	—	—	—	—	0.3	10.6	73	544	7.5	—	—	—	—	—	—
	Minimum	1.1	1.32	—	—	—	—	—	0	4.4	32	509	7.4	—	—	—	—	—	—
	Maximum	10.7	10.9	—	—	—	—	—	2.5	11.8	81	610	7.7	—	—	—	—	—	—
	Std. dev.	2.48	2.48	—	—	—	—	—	0.57	1.68	11	26.3	0.07	—	—	—	—	—	—
	N obs.	29	29	0	—	—	—	—	29	29	29	29	29	—	0	0	0	0	0

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1996 Near-surface measurements: spring																			
1. Main channel	Mean	0.2	6.19	—	—	—	—	—	9.87	11.7	103	312	8.3	66.4	13	19.7	5.7	—	35.6
	Median	0.2	5.95	—	—	—	—	—	9.8	11.7	102	309	8.3	73	9	14.4	6	—	36.3
	Minimum	0.2	2.2	—	—	—	—	—	8.2	10.7	95	58	7.2	47	7	8.6	3.1	—	2.8
	Maximum	0.2	21	—	—	—	—	—	11.1	13	118	423	8.5	83	22	36.5	8	—	50.8
	Std. dev.	0	3.65	—	—	—	—	—	0.72	0.61	5.58	79.2	0.25	13.6	5.59	10.9	1.85	—	11.8
	N obs.	24	24	0	0	0	0	0	24	24	24	24	24	24	24	24	24	0	24
2. Side channel	Mean	0.2	3.4	0.72	—	—	—	—	9.89	12.1	107	292	8.3	74	10	17.1	7.1	36.9	33.6
	Median	0.2	3.3	0.69	—	—	—	—	9.9	12.3	108	312	8.4	76.5	8	13.3	7.5	35.6	35.8
	Minimum	0.2	0.9	0.23	—	—	—	—	8.8	10.1	88	76	7.1	51	5	5.4	1.8	32.5	2.34
	Maximum	0.2	7.6	1.17	—	—	—	—	11.1	13.5	120	386	8.6	106	19	35	10.7	43.8	48.9
	Std. dev.	0	1.87	0.25	—	—	—	—	0.59	0.76	7.18	64.3	0.29	14.6	4.48	8.54	2.09	4.99	11.6
	N obs.	32	32	32	0	0	0	0	32	32	32	32	32	32	32	32	29	4	32
3. Backwater	Mean	0.2	1.91	0.18	—	—	—	—	9.9	12.8	113	247	8.3	77.9	9	13.1	5.4	32.5	38.7
	Median	0.2	1.8	0.15	—	—	—	—	9.7	12.4	109	269	8.4	77	9	11.3	4.5	39.7	32.6
	Minimum	0.2	0.9	0.01	—	—	—	—	8.1	9.4	82	69	7.1	46	3	2.4	1.4	15.8	1.64
	Maximum	0.2	3.7	0.62	—	—	—	—	12.6	18.9	171	430	9.6	153	17	31.3	17.1	40.2	181
	Std. dev.	0	0.65	0.14	—	—	—	—	1.15	1.91	19	88.1	0.55	20.2	3.17	6.17	2.97	10.9	31.9
	N obs.	49	49	49	0	0	0	0	49	49	49	49	49	48	49	49	47	5	49
4. Lake	Mean	0.2	7.88	—	—	—	—	—	11.3	14.6	133	313	8.8	68.8	10	12.6	7	50.8	46.1
	Median	0.2	8.8	—	—	—	—	—	11.2	14.8	135	303	8.8	66.5	10	12.6	6.8	48.5	44
	Minimum	0.2	2.2	—	—	—	—	—	10.4	12.2	111	269	8.4	55	6	8	5.7	46.2	30.3
	Maximum	0.2	11.5	—	—	—	—	—	12.6	17.6	164	361	9	86	17	29.6	9.7	57.7	77
	Std. dev.	0	2.84	—	—	—	—	—	0.56	1.16	11.6	29.2	0.16	9.76	2.36	3.9	0.93	6.12	10.3
	N obs.	30	30	0	0	0	0	0	30	30	30	30	30	30	30	30	25	3	30
1996 Near-bottom measurements: spring																			
3. Backwater	Mean	1.71	1.91	—	—	—	—	—	9.66	12.3	109	247	8.2	—	—	—	—	—	—
	Median	1.6	1.8	—	—	—	—	—	9.7	12.2	107	276	8.3	—	—	—	—	—	—
	Minimum	0.7	0.9	—	—	—	—	—	8.1	9.4	82	69	7	—	—	—	—	—	—
	Maximum	3.5	3.7	—	—	—	—	—	10.9	18.6	167	434	9.6	—	—	—	—	—	—
	Std. dev.	0.65	0.65	—	—	—	—	—	0.81	1.72	16.4	88.5	0.54	—	—	—	—	—	—
	N obs.	49	49	0	—	—	—	—	49	49	49	49	49	—	0	0	0	0	0

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1996 Near-bottom measurements: spring																			
4. Lake	Mean	7.68	7.88	—	—	—	—	—	9.97	12.5	111	326	8.4	—	—	—	—	—	—
	Median	8.6	8.8	—	—	—	—	—	9.9	12.4	110	341	8.4	—	—	—	—	—	—
	Minimum	2	2.2	—	—	—	—	—	9.4	11.4	101	264	8.2	—	—	—	—	—	—
	Maximum	11.3	11.5	—	—	—	—	—	11.2	15.7	143	365	8.8	—	—	—	—	—	—
	Std. dev.	2.84	2.84	—	—	—	—	—	0.49	0.86	8.5	32.2	0.14	—	—	—	—	—	—
	N obs.	30	30	0	—	—	—	—	30	30	30	30	30	—	0	0	0	0	0
1996 Near-surface measurements: summer																			
1. Main channel	Mean	0.2	3.8	—	—	—	—	—	24.2	7.51	90	395	8.1	69.3	15	20.4	6	10.3	11
	Median	0.2	3.7	—	—	—	—	—	23.9	7.4	91	405	8.1	58	13	18.3	5.3	9.26	13.1
	Minimum	0.2	1.16	—	—	—	—	—	23	6.7	80	146	7.9	30	5	3.8	2.5	-1	1.33
	Maximum	0.2	7.3	—	—	—	—	—	25.8	8.8	104	484	8.2	131	29	48.3	11.6	23.5	19
	Std. dev.	0	1.84	—	—	—	—	—	0.88	0.53	5.84	79.7	0.08	35.4	9.04	15.2	2.93	13.1	5.49
	N obs.	25	25	0	0	0	0	0	25	25	25	25	25	24	25	25	25	4	25
2. Side channel	Mean	0.2	2.18	0.27	—	—	—	—	24.2	8.15	98	360	8.1	51.8	18	23.8	6.5	0.83	15.6
	Median	0.2	2.15	0.29	—	—	—	—	23.7	7.9	94	392	8.1	47	17	19.6	5.4	0.83	13.3
	Minimum	0.2	0.28	0.14	—	—	—	—	23.1	6.9	83	210	8	22	6	5.2	2.6	-1	1.33
	Maximum	0.2	6.1	0.42	—	—	—	—	28.9	12.9	170	486	8.8	121	40	71.7	17	2.66	56.5
	Std. dev.	0	1.44	0.07	—	—	—	—	1.24	1.05	15.1	91.1	0.15	24.8	9.61	16.6	3.46	2.59	10
	N obs.	30	30	17	0	0	0	0	30	30	30	30	30	25	30	30	30	2	30
3. Backwater	Mean	0.2	0.98	0.06	—	—	—	—	24.4	9.29	112	348	8.2	35.7	27	35.4	10.3	92.9	33.2
	Median	0.2	0.87	0.07	—	—	—	—	24.4	8.75	104	396	8.2	34	22	28.3	8.1	70.2	23
	Minimum	0.2	0.4	0	—	—	—	—	22	6.2	74	197	7.5	13	7	4.8	3.2	-1	1.59
	Maximum	0.2	3.3	0.16	—	—	—	—	29.2	25	310	508	9.1	76	81	112	39.4	232	200
	Std. dev.	0	0.53	0.04	—	—	—	—	1.42	2.75	35	111	0.35	13.4	18.9	25.9	6.76	113	33.9
	N obs.	50	50	41	0	0	0	0	50	50	50	50	50	47	50	50	50	4	50
4. Lake	Mean	0.2	6.07	—	—	—	—	—	24.3	7.48	90	456	8.2	67.8	13	13.4	5.3	1.33	17.6
	Median	0.2	7.05	—	—	—	—	—	24.3	7.2	86	460	8.1	63.5	10	9.9	4.3	-1	17.2
	Minimum	0.2	1.1	—	—	—	—	—	23.2	6.6	79	407	8	29	4	3.1	2	-1	2.22
	Maximum	0.2	9.7	—	—	—	—	—	25.7	12.2	151	500	8.7	128	30	43.4	13	5.98	55.4
	Std. dev.	0	2.6	—	—	—	—	—	0.56	1.1	14	24.6	0.14	29.4	7.45	11	2.93	4.03	12.1
	N obs.	30	30	0	0	0	0	0	30	30	30	30	30	30	30	30	30	3	30

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1996 Near-bottom measurements: summer																			
3. Backwater	Mean	0.92	1.11	—	—	—	—	—	24	8.73	104	338	8.2	—	—	—	—	—	—
	Median	0.8	1.01	—	—	—	—	—	24	8.6	102	286	8.2	—	—	—	—	—	—
	Minimum	0.3	0.5	—	—	—	—	—	22.4	6.1	73	197	7.6	—	—	—	—	—	—
	Maximum	3.1	3.3	—	—	—	—	—	26.3	12.3	149	512	8.9	—	—	—	—	—	—
	Std. dev.	0.51	0.52	—	—	—	—	—	1.21	1.4	17	110	0.28	—	—	—	—	—	—
	N obs.	40	40	0	—	—	—	—	40	40	40	40	40	—	0	0	0	0	0
4. Lake	Mean	5.87	6.07	—	—	—	—	—	24.2	7.03	84	458	8.1	—	—	—	—	—	—
	Median	6.85	7.05	—	—	—	—	—	24.2	6.75	81	460	8.1	—	—	—	—	—	—
	Minimum	0.9	1.1	—	—	—	—	—	23.2	6.1	73	405	7.9	—	—	—	—	—	—
	Maximum	9.5	9.7	—	—	—	—	—	25.4	10.1	122	503	8.4	—	—	—	—	—	—
	Std. dev.	2.6	2.6	—	—	—	—	—	0.52	0.84	10.5	26.2	0.12	—	—	—	—	—	—
	N obs.	30	30	0	—	—	—	—	30	30	30	30	30	—	0	0	0	0	0
1996 Near-surface measurements: fall																			
1. Main channel	Mean	0.2	3.98	—	—	—	—	—	13.8	10.2	98	381	8.3	63.2	14	18.4	6.8	38.6	24.8
	Median	0.2	3.8	—	—	—	—	—	14.1	10	97	426	8.3	59	15	20.6	7.2	38.6	21.8
	Minimum	0.2	0.72	—	—	—	—	—	10.7	9.4	92	155	8.1	38	6	7.1	3.3	38.6	14.4
	Maximum	0.2	7.9	—	—	—	—	—	15.7	11.3	107	464	8.6	100	24	32.4	9.4	38.6	43.7
	Std. dev.	0	1.42	—	—	—	—	—	1.77	0.69	4.16	95.2	0.18	22.1	5.72	7.89	2	—	8.58
	N obs.	24	24	0	0	0	0	0	24	24	24	24	24	24	24	24	24	1	24
2. Side channel	Mean	0.2	2.1	0.17	—	—	—	—	12.9	10.6	100	408	8.4	69.7	11	14.5	6.1	32.5	30.3
	Median	0.2	2	0.16	—	—	—	—	12.4	10.5	100	433	8.4	71	9	13.4	5.6	27.2	23
	Minimum	0.2	0.34	0.06	—	—	—	—	8.5	9.6	87	239	8.1	37	5	6.4	3.1	19	13.1
	Maximum	0.2	5.2	0.42	—	—	—	—	16.4	12.7	125	557	8.8	105	20	26.3	9.3	56.6	67.8
	Std. dev.	0	1.22	0.08	—	—	—	—	2.07	0.82	9.18	69.8	0.19	20.5	4.7	5.72	1.76	16.5	15.5
	N obs.	32	32	18	0	0	0	0	32	32	32	32	32	27	32	32	32	4	32
3. Backwater	Mean	0.2	1.05	0.07	—	—	—	—	12.1	11.1	103	346	8.4	55.3	20	33.5	9.9	43.8	44.5
	Median	0.2	0.9	0.05	—	—	—	—	11.8	10.8	98	373	8.3	60	12	17.5	6.6	39.5	28.5
	Minimum	0.2	0.3	0	—	—	—	—	7.7	8	81	201	7.6	22	7	8.4	4.3	29.2	16.2
	Maximum	0.2	3.1	0.65	—	—	—	—	18.4	19	190	485	9.2	89	84	248	36.2	66.9	157
	Std. dev.	0	0.58	0.11	—	—	—	—	2.89	1.69	18.4	93	0.31	19.5	16.9	39.2	7.02	17.5	36
	N obs.	48	48	32	0	0	0	0	48	48	48	48	48	41	48	48	48	4	48

Table F-1. Continued.

Sampling stratum	Statistic	Sample depth (m)	Water depth (m)	Water velocity (m/s)	Ice cover (%)	Thickness of ice (cm)	Snow cover (%)	Snow depth (cm)	Water temp. (°C)	Dissolved oxygen (mg/L)	Oxygen saturation (%)	Specific cond. (µS)	pH	Secchi depth (cm)	Turbidity (NTU)	Total suspended solids (mg/L)	Volatile suspended solids (mg/L)	Spectr. chl. (µg/L)	Fluor. chl. (µg/L)
1996 Near-surface measurements: fall																			
4. Lake	Mean	0.2	5.51	—	—	—	—	—	15.1	11.2	111	458	8.5	57.4	16	18	8.1	27.5	21.4
	Median	0.2	6.5	—	—	—	—	—	14.9	11.1	112	457	8.5	57	11	13	7	23.4	18.7
	Minimum	0.2	0.9	—	—	—	—	—	13.7	8.9	88	453	8	16	5	7.2	5.3	22.1	6.83
	Maximum	0.2	9.9	—	—	—	—	—	17.9	13.5	131	469	8.7	96	90	94.9	23.4	41	42.9
	Std. dev.	0	2.71	—	—	—	—	—	1.11	1.1	10.4	3.38	0.16	20.4	16.2	16.9	3.49	9.06	8.18
	N obs.	29	29	0	0	0	0	0	29	29	29	29	29	29	29	29	29	4	29
1996 Near-bottom measurements: fall																			
3. Backwater	Mean	1.06	1.25	—	—	—	—	—	11.1	11.1	101	321	8.4	—	—	—	—	—	—
	Median	1	1.13	—	—	—	—	—	10.4	10.9	98	313	8.4	—	—	—	—	—	—
	Minimum	0.4	0.6	—	—	—	—	—	7.7	8.5	80	201	7.6	—	—	—	—	—	—
	Maximum	2.9	3.1	—	—	—	—	—	15.7	13.2	130	446	9	—	—	—	—	—	—
	Std. dev.	0.57	0.57	—	—	—	—	—	2.36	1.04	13	86.9	0.29	—	—	—	—	—	—
	N obs.	33	33	0	—	—	—	—	33	33	33	33	33	—	0	0	0	0	0
4. Lake	Mean	5.26	5.46	—	—	—	—	—	13.8	9.84	95	461	8.3	—	—	—	—	—	—
	Median	6	6.2	—	—	—	—	—	13.6	9.65	93	459	8.3	—	—	—	—	—	—
	Minimum	0.7	0.9	—	—	—	—	—	13.3	8.6	84	455	8	—	—	—	—	—	—
	Maximum	9.7	9.9	—	—	—	—	—	15.3	13.4	130	485	8.7	—	—	—	—	—	—
	Std. dev.	2.68	2.68	—	—	—	—	—	0.51	0.94	9.07	5.68	0.14	—	—	—	—	—	—
	N obs.	30	30	0	—	—	—	—	30	30	30	30	30	—	0	0	0	0	0

Table F-2. Summaries of chemical measurements during each stratified random sampling episode from 1993 through 1996. Data are grouped into three sampling-depth categories; near surface (less than 0.2m below the surface), middepth, and near bottom (less than 0.2m above the substrate).

Sampling stratum	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
1993 Near-surface measurements: summer													
1. Main channel	Mean	3.681	0.05	2.506	0.221	0.14	—	—	—	—	—	—	—
	Median	3.601	0.048	2.509	0.225	0.144	—	—	—	—	—	—	—
	Minimum	2.88	0.028	1.749	0.171	0.117	—	—	—	—	—	—	—
	Maximum	4.876	0.068	2.837	0.236	0.156	—	—	—	—	—	—	—
	Std. dev.	0.529	0.01	0.271	0.017	0.012	—	—	—	—	—	—	—
	N obs.	13	13	13	13	13	0	0	0	0	0	0	0
2. Side channel	Mean	3.533	0.043	2.279	0.225	0.126	—	—	—	—	—	—	—
	Median	3.572	0.04	2.609	0.225	0.125	—	—	—	—	—	—	—
	Minimum	2.451	-0.02	0.619	0.181	0.018	—	—	—	—	—	—	—
	Maximum	4.318	0.066	2.68	0.241	0.155	—	—	—	—	—	—	—
	Std. dev.	0.587	0.014	0.652	0.014	0.036	—	—	—	—	—	—	—
	N obs.	16	16	16	16	16	0	0	0	0	0	0	0
3. Backwater	Mean	3.167	0.05	1.917	0.221	0.114	—	—	—	—	—	—	—
	Median	3.427	0.049	2.091	0.225	0.128	—	—	—	—	—	—	—
	Minimum	1.241	-0.02	0.056	0.175	-0.01	—	—	—	—	—	—	—
	Maximum	4.394	0.118	2.764	0.278	0.158	—	—	—	—	—	—	—
	Std. dev.	0.872	0.025	0.823	0.02	0.04	—	—	—	—	—	—	—
	N obs.	27	27	27	27	27	0	0	0	0	0	0	0
4. Lake	Mean	3.751	0.028	2.516	0.216	0.128	—	—	—	—	—	—	—
	Median	3.722	0.023	2.48	0.221	0.131	—	—	—	—	—	—	—
	Minimum	3.301	-0.02	2.356	0.14	0.105	—	—	—	—	—	—	—
	Maximum	4.199	0.065	2.736	0.234	0.153	—	—	—	—	—	—	—
	Std. dev.	0.26	0.017	0.119	0.021	0.015	—	—	—	—	—	—	—
	N obs.	16	16	16	16	16	0	0	0	0	0	0	0
1993 Near-surface measurements: fall													
1. Main channel	Mean	3.549	0.025	2.059	0.162	0.078	—	—	—	—	—	—	—
	Median	3.605	0.024	2.097	0.166	0.074	—	—	—	—	—	—	—
	Minimum	2.638	-0.02	1.487	0.133	0.059	—	—	—	—	—	—	—
	Maximum	4.214	0.049	2.528	0.193	0.109	—	—	—	—	—	—	—
	Std. dev.	0.431	0.014	0.31	0.017	0.02	—	—	—	—	—	—	—
	N obs.	13	13	13	13	13	0	0	0	0	0	0	0

Table F-2. Continued.

Sampling stratum	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1993 Near-surface measurements: fall							
2. Side channel	Mean	3.427	0.02	1.82	0.162	0.066	—	—	—	—	—	—	—
	Median	3.314	-0.02	1.995	0.156	0.062	—	—	—	—	—	—	—
	Minimum	2.298	-0.02	-0.01	0.127	0.017	—	—	—	—	—	—	—
	Maximum	4.641	0.048	2.898	0.24	0.095	—	—	—	—	—	—	—
	Std. dev.	0.606	0.013	0.635	0.028	0.023	—	—	—	—	—	—	—
	N obs.	16	16	16	16	16	0	0	0	0	0	0	0
3. Backwater	Mean	3.286	0.017	1.427	0.173	0.05	—	—	—	—	—	—	—
	Median	3.144	-0.02	1.441	0.159	0.051	—	—	—	—	—	—	—
	Minimum	2.111	-0.02	0.143	0.119	-0.01	—	—	—	—	—	—	—
	Maximum	4.49	0.046	2.271	0.325	0.093	—	—	—	—	—	—	—
	Std. dev.	0.647	0.011	0.656	0.047	0.027	—	—	—	—	—	—	—
	N obs.	28	28	28	28	28	0	0	0	0	0	0	0
4. Lake	Mean	3.809	0.04	2.075	0.172	0.083	—	—	—	—	—	—	—
	Median	3.856	0.038	2.105	0.168	0.08	—	—	—	—	—	—	—
	Minimum	2.929	-0.02	1.684	0.149	0.057	—	—	—	—	—	—	—
	Maximum	4.383	0.069	2.443	0.197	0.111	—	—	—	—	—	—	—
	Std. dev.	0.35	0.017	0.201	0.014	0.015	—	—	—	—	—	—	—
	N obs.	16	16	16	16	16	0	0	0	0	0	0	0
						1994 Near-surface measurements: winter							
1. Main channel	Mean	2.578	0.204	2.243	0.105	0.077	—	—	—	—	—	—	—
	Median	2.535	0.18	2.29	0.102	0.078	—	—	—	—	—	—	—
	Minimum	1.558	0.134	1.489	0.09	0.054	—	—	—	—	—	—	—
	Maximum	4.598	0.365	2.437	0.13	0.098	—	—	—	—	—	—	—
	Std. dev.	0.782	0.072	0.244	0.013	0.012	—	—	—	—	—	—	—
	N obs.	12	13	13	12	13	0	0	0	0	0	0	0
2. Side channel	Mean	2.476	0.263	2.227	0.114	0.085	—	—	—	—	—	—	—
	Median	2.284	0.205	2.221	0.11	0.079	—	—	—	—	—	—	—
	Minimum	2.013	0.175	2.123	0.098	0.07	—	—	—	—	—	—	—
	Maximum	3.229	0.363	2.376	0.126	0.098	—	—	—	—	—	—	—
	Std. dev.	0.378	0.081	0.074	0.01	0.011	—	—	—	—	—	—	—
	N obs.	16	16	16	16	16	0	0	0	0	0	0	0

Table F-2. Continued.

Sampling stratum	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
1994 Near-surface measurements: winter													
3. Backwater	Mean	2.604	0.267	2.142	0.114	0.075	—	—	—	—	—	—	—
	Median	2.333	0.196	2.257	0.106	0.074	—	—	—	—	—	—	—
	Minimum	1.343	0.105	0.503	0.042	0.011	—	—	—	—	—	—	—
	Maximum	5.786	0.7	3.065	0.236	0.156	—	—	—	—	—	—	—
	Std. dev.	0.836	0.146	0.554	0.034	0.032	—	—	—	—	—	—	—
	N obs.	28	27	27	28	27	0	0	0	0	0	0	0
4. Lake	Mean	3.08	0.228	2.689	0.117	0.086	—	—	—	—	—	—	—
	Median	3.088	0.232	2.647	0.121	0.09	—	—	—	—	—	—	—
	Minimum	2.281	0.093	2.21	0.068	0.044	—	—	—	—	—	—	—
	Maximum	4.125	0.368	3.3	0.133	0.099	—	—	—	—	—	—	—
	Std. dev.	0.516	0.083	0.335	0.016	0.014	—	—	—	—	—	—	—
	N obs.	16	16	16	16	16	0	0	0	0	0	0	0
1994 Near-surface measurements: spring													
1. Main channel	Mean	1.594	0.011	1.044	0.075	0.005	3.625	—	—	—	—	10.62	48.54
	Median	1.606	-0.02	0.958	0.079	-0.01	3.516	—	—	—	—	12	55.79
	Minimum	0.728	-0.02	0.491	0.051	-0.01	3.106	—	—	—	—	1.846	1.637
	Maximum	2.218	0.026	1.603	0.095	-0.01	4.199	—	—	—	—	13.27	63.03
	Std. dev.	0.372	0.004	0.323	0.013	0	0.402	—	—	—	—	3.098	17.04
	N obs.	13	13	13	13	13	13	0	0	0	0	13	13
2. Side channel	Mean	1.848	0.016	1.115	0.079	0.005	3.576	57.57	3.24	27.35	14.02	10.78	48.32
	Median	1.74	-0.02	1.017	0.08	-0.01	3.431	57.57	3.24	27.35	14.02	11.31	47.54
	Minimum	1.396	-0.02	0.686	0.047	-0.01	2.875	57.57	3.24	27.35	14.02	7.41	26.07
	Maximum	2.696	0.035	1.465	0.115	-0.01	4.437	57.57	3.24	27.35	14.02	13.36	63.47
	Std. dev.	0.34	0.008	0.263	0.017	0	0.481	—	—	—	—	1.691	12.01
	N obs.	16	16	16	16	16	16	1	1	1	1	16	16
3. Backwater	Mean	1.717	0.024	0.783	0.082	0.005	2.605	—	—	—	—	9.208	37.76
	Median	1.669	-0.02	0.954	0.077	-0.01	2.974	—	—	—	—	9.454	36.23
	Minimum	0.786	-0.02	0.131	0.049	-0.01	-0.05	—	—	—	—	2.54	7.869
	Maximum	2.88	0.079	1.362	0.161	-0.01	4.115	—	—	—	—	13.26	62.32
	Std. dev.	0.424	0.02	0.371	0.029	0	1.298	—	—	—	—	2.686	19.19
	N obs.	25	27	27	25	27	27	0	0	0	0	27	27

Table F-2. Continued.

Sampling stratum	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1994 Near-surface measurements: spring							
4. Lake	Mean	1.887	0.023	1.341	0.065	0.005	3.251	—	—	—	—	10.31	46.48
	Median	1.666	0.023	1.245	0.066	-0.01	3.096	—	—	—	—	10.96	47.31
	Minimum	1.241	-0.02	0.902	0.039	-0.01	1.816	—	—	—	—	6.541	32.75
	Maximum	2.669	0.033	1.805	0.091	-0.01	4.127	—	—	—	—	12.22	61.49
	Std. dev.	0.467	0.007	0.334	0.015	0	0.602	—	—	—	—	1.654	8.437
	N obs.	16	16	16	16	16	16	0	0	0	0	16	16
						1994 Near-surface measurements: summer							
1. Main channel	Mean	2.961	0.049	1.661	0.157	0.031	7.21	—	—	—	—	11.06	48.77
	Median	2.914	0.026	1.716	0.158	0.02	7.383	—	—	—	—	12.08	50.32
	Minimum	2.37	-0.02	1.221	0.129	-0.01	4.496	—	—	—	—	4.241	22.51
	Maximum	3.382	0.216	2.134	0.191	0.086	8.708	—	—	—	—	15.16	60.83
	Std. dev.	0.333	0.063	0.221	0.019	0.026	1.008	—	—	—	—	2.926	9.372
	N obs.	13	13	13	13	13	13	0	0	0	0	13	13
2. Side channel	Mean	2.587	0.029	1.32	0.139	0.038	6.685	—	—	—	—	10.08	40.9
	Median	2.448	-0.02	1.251	0.141	0.044	7.052	—	—	—	—	10.19	41.88
	Minimum	1.661	-0.02	0.774	0.093	-0.01	3.665	—	—	—	—	6.067	14.42
	Maximum	3.678	0.111	1.76	0.175	0.062	8.767	—	—	—	—	13.73	59.48
	Std. dev.	0.61	0.027	0.34	0.024	0.017	1.37	—	—	—	—	2.16	12.4
	N obs.	16	16	16	16	16	16	0	0	0	0	16	16
3. Backwater	Mean	2.381	0.049	1.108	0.157	0.024	5.63	—	—	—	—	9.867	41.7
	Median	2.219	-0.02	1.079	0.152	0.018	5.822	—	—	—	—	9.414	43.02
	Minimum	1.412	-0.02	0.157	0.079	-0.01	2.483	—	—	—	—	4.906	17.4
	Maximum	3.415	0.177	2.059	0.355	0.083	7.943	—	—	—	—	14.74	56.8
	Std. dev.	0.557	0.059	0.517	0.049	0.02	1.635	—	—	—	—	2.345	11.49
	N obs.	28	27	27	28	27	27	0	0	0	0	27	27
4. Lake	Mean	3.136	0.073	1.7	0.326	0.027	6.682	—	—	—	—	11.59	48.1
	Median	3.159	0.047	1.656	0.16	0.023	6.681	—	—	—	—	12	48.31
	Minimum	2.567	-0.02	1.397	0.129	0.01	3.335	—	—	—	—	8.772	34.67
	Maximum	3.586	0.29	2.114	2.889	0.086	8.591	—	—	—	—	13.84	59.27
	Std. dev.	0.296	0.064	0.214	0.684	0.019	1.238	—	—	—	—	1.611	6.027
	N obs.	16	16	16	16	16	16	0	0	0	0	16	16

Table F-2. Continued.

Sampling stratum	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1994 Near-surface measurements: fall							
1. Main channel	Mean	2.905	0.027	2.008	0.149	0.055	7.22	—	—	—	—	12	29.06
	Median	2.862	0.025	2.237	0.146	0.05	7.313	—	—	—	—	14.11	35.36
	Minimum	1.337	-0.02	0.126	0.099	0.024	5.412	—	—	—	—	4.007	4.568
	Maximum	4.232	0.057	3.8	0.196	0.122	8.928	—	—	—	—	15.48	38.76
	Std. dev.	0.875	0.016	1.092	0.027	0.028	1.023	—	—	—	—	4.319	12.1
	N obs.	13	13	13	13	13	13	0	0	0	0	13	13
2. Side channel	Mean	3.239	0.024	2.551	0.16	0.044	7.5	—	—	—	—	13.31	31.9
	Median	2.92	0.021	2.337	0.15	0.043	7.731	—	—	—	—	14.8	36.41
	Minimum	1.768	-0.02	0.933	0.115	0.027	6.28	—	—	—	—	5.892	13.19
	Maximum	5.626	0.066	3.825	0.215	0.065	8.467	—	—	—	—	23.08	41.37
	Std. dev.	1.037	0.016	1.019	0.028	0.011	0.799	—	—	—	—	4.314	9.336
	N obs.	18	18	18	18	17	17	0	0	0	0	17	17
3. Backwater	Mean	2.6	0.03	1.791	0.165	0.039	6.813	—	—	—	—	10.79	24.92
	Median	1.974	-0.02	1.063	0.16	0.035	6.586	—	—	—	—	7.695	17.86
	Minimum	1.524	-0.02	0.491	0.107	0.017	4.145	—	—	—	—	4.859	8.878
	Maximum	5.415	0.249	4.624	0.323	0.081	10.25	—	—	—	—	21.09	41.26
	Std. dev.	1.101	0.049	1.177	0.058	0.018	1.336	—	—	—	—	5.087	12.67
	N obs.	24	24	24	24	24	24	0	0	0	0	24	24
4. Lake	Mean	3.255	0.018	2.675	0.165	0.05	7.978	—	—	—	—	15.16	37.72
	Median	3.048	-0.02	2.44	0.168	0.048	7.829	—	—	—	—	14.92	37.55
	Minimum	2.492	-0.02	1.992	0.125	0.023	7.405	—	—	—	—	11.97	31.56
	Maximum	4.567	0.054	3.773	0.202	0.077	8.708	—	—	—	—	16.91	40.9
	Std. dev.	0.587	0.014	0.559	0.021	0.014	0.406	—	—	—	—	1.176	2.288
	N obs.	17	17	17	17	17	17	0	0	0	0	17	17
						1995 Near-surface measurements: winter							
1. Main channel	Mean	2.545	0.074	1.943	0.107	0.044	6.776	—	—	—	—	20.2	39.27
	Median	2.433	0.03	1.972	0.099	0.034	6.862	—	—	—	—	20.6	40.97
	Minimum	2.269	-0.02	1.748	0.082	-0.01	6.221	—	—	—	—	14.87	30.9
	Maximum	3.538	0.188	2.039	0.14	0.127	7.119	—	—	—	—	24.09	43.81
	Std. dev.	0.348	0.074	0.085	0.021	0.035	0.295	—	—	—	—	3	3.953
	N obs.	13	13	13	13	13	13	0	0	0	0	13	13

Table F-2. Continued.

Sampling stratum	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
1995 Near-surface measurements: winter													
2. Side channel	Mean	2.495	0.093	1.925	0.111	0.052	6.672	—	—	—	—	20.44	38.61
	Median	2.469	0.052	1.95	0.1	0.023	6.668	—	—	—	—	21.89	41.37
	Minimum	2.236	0.021	1.614	0.09	-0.01	5.199	—	—	—	—	9.198	17.79
	Maximum	3.025	0.217	2.459	0.146	0.128	7.384	—	—	—	—	24.91	43.38
	Std. dev.	0.189	0.079	0.209	0.021	0.046	0.461	—	—	—	—	4.43	7.325
	N obs.	16	16	16	16	16	16	0	0	0	0	16	16
3. Backwater	Mean	2.34	0.135	1.611	0.099	0.022	6.467	—	—	—	—	16.66	32.06
	Median	2.387	0.03	1.818	0.091	0.018	6.748	—	—	—	—	17.65	33.99
	Minimum	0.68	-0.02	0.191	0.023	-0.01	0.907	—	—	—	—	4.451	11.01
	Maximum	3.522	1.525	2.58	0.199	0.109	8.898	—	—	—	—	25.04	44.02
	Std. dev.	0.538	0.35	0.645	0.043	0.024	1.564	—	—	—	—	5.116	9.076
	N obs.	18	18	18	18	17	17	0	0	0	0	17	17
4. Lake	Mean	2.635	0.059	2.337	0.119	0.026	6.785	—	—	—	—	23.27	44.28
	Median	2.524	0.02	2.041	0.102	0.026	6.757	—	—	—	—	24.02	44.27
	Minimum	2.302	-0.02	1.803	0.092	-0.01	6.155	—	—	—	—	14.41	32.46
	Maximum	4.308	0.184	7.204	0.225	0.06	7.945	—	—	—	—	30.19	50.72
	Std. dev.	0.464	0.064	1.308	0.036	0.014	0.394	—	—	—	—	3.888	5.144
	N obs.	16	16	16	16	16	16	0	0	0	0	16	16
1995 Near-surface measurements: spring													
1. Main channel	Mean	3.288	0.055	3.52	0.063	0.005	4.465	—	—	—	—	12.79	63.99
	Median	3.754	0.057	3.708	0.058	-0.01	4.351	—	—	—	—	11.83	61.45
	Minimum	1.703	0.037	1.421	0.04	-0.01	3.843	—	—	—	—	8.477	28.29
	Maximum	4.04	0.082	4.33	0.168	-0.01	5.214	—	—	—	—	17.2	89.31
	Std. dev.	0.761	0.014	0.772	0.033	0	0.438	—	—	—	—	2.593	18.88
	N obs.	13	13	13	13	13	8	0	0	0	0	8	8
2. Side channel	Mean	3.118	0.056	3.408	0.052	0.005	4.349	—	—	—	—	12.79	65.67
	Median	3.212	0.054	3.499	0.044	-0.01	4.275	—	—	—	—	12.37	64.91
	Minimum	1.623	0.031	1.355	0.037	-0.01	3.682	—	—	—	—	8.802	31.42
	Maximum	4.312	0.082	4.235	0.09	-0.01	5.084	—	—	—	—	15.17	82.73
	Std. dev.	0.75	0.016	0.822	0.015	0	0.344	—	—	—	—	2.346	17.5
	N obs.	16	16	16	16	16	10	0	0	0	0	10	10

Table F-2. Continued.

Sampling stratum	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
1995 Near-surface measurements: spring													
3. Backwater	Mean	3.109	0.048	2.994	0.048	0.005	4.017	—	—	—	—	11.42	53.84
	Median	3.304	0.049	3.334	0.046	-0.01	4.332	—	—	—	—	11.98	57.18
	Minimum	0.652	-0.02	0.125	0.035	-0.01	1.966	—	—	—	—	5.567	6.365
	Maximum	7.812	0.077	4.439	0.065	0.011	5.327	—	—	—	—	16.37	83.91
	Std. dev.	1.307	0.014	1.244	0.008	0.001	0.921	—	—	—	—	3.637	24.28
	N obs.	30	30	30	30	30	13	0	0	0	0	13	13
4. Lake	Mean	3.318	0.047	3.839	0.05	0.008	5.051	—	—	—	—	15.17	69.59
	Median	3.41	0.044	3.796	0.047	-0.01	5.041	—	—	—	—	14.86	68.2
	Minimum	0.927	-0.02	3.268	0.039	-0.01	4.808	—	—	—	—	14.12	63.41
	Maximum	3.954	0.084	4.43	0.078	0.045	5.204	—	—	—	—	16.81	77.04
	Std. dev.	0.665	0.022	0.327	0.01	0.01	0.135	—	—	—	—	0.91	5.908
	N obs.	17	17	17	17	17	6	0	0	0	0	6	6
1995 Near-surface measurements: summer													
1. Main channel	Mean	3.168	0.074	2.151	0.228	0.069	—	—	—	—	—	—	—
	Median	2.601	0.076	1.56	0.261	0.078	—	—	—	—	—	—	—
	Minimum	2.194	0.039	0.975	0.137	0.022	—	—	—	—	—	—	—
	Maximum	4.398	0.107	3.481	0.307	0.094	—	—	—	—	—	—	—
	Std. dev.	0.955	0.022	1.031	0.062	0.022	—	—	—	—	—	—	—
	N obs.	13	13	13	13	13	0	0	0	0	0	0	0
2. Side channel	Mean	3.289	0.071	2.183	0.213	0.057	8.291	—	—	—	—	13.87	58.65
	Median	2.876	0.066	1.584	0.189	0.051	8.291	—	—	—	—	13.87	58.65
	Minimum	2.102	0.035	0.895	0.148	0.025	8.291	—	—	—	—	13.87	58.65
	Maximum	5.45	0.103	3.528	0.295	0.092	8.291	—	—	—	—	13.87	58.65
	Std. dev.	1.048	0.023	1.05	0.056	0.02	—	—	—	—	—	—	—
	N obs.	13	15	15	13	16	1	0	0	0	0	1	1
3. Backwater	Mean	2.512	0.08	1.138	0.203	0.046	—	—	—	—	—	—	—
	Median	2.474	0.071	0.954	0.186	0.047	—	—	—	—	—	—	—
	Minimum	1.311	0.03	-0.01	0.148	-0.01	—	—	—	—	—	—	—
	Maximum	4.448	0.277	3.45	0.383	0.093	—	—	—	—	—	—	—
	Std. dev.	0.715	0.049	0.842	0.059	0.025	—	—	—	—	—	—	—
	N obs.	23	26	26	23	27	0	0	0	0	0	0	0

Table F-2. Continued.

Sampling stratum	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1995 Near-surface measurements: summer							
4. Lake	Mean	3.203	0.064	1.991	0.232	0.064	—	—	—	—	—	—	—
	Median	2.916	0.063	1.802	0.215	0.062	—	—	—	—	—	—	—
	Minimum	2.647	-0.02	1.42	0.167	-0.01	—	—	—	—	—	—	—
	Maximum	4.863	0.108	3.46	0.427	0.098	—	—	—	—	—	—	—
	Std. dev.	0.678	0.031	0.513	0.069	0.026	—	—	—	—	—	—	—
	N obs.	17	15	15	17	15	0	0	0	0	0	0	0
						1995 Near-surface measurements: fall							
1. Main channel	Mean	4.365	0.081	1.011	0.137	0.031	5.759	—	—	—	—	15.63	39.47
	Median	2.245	0.08	0.808	0.124	0.03	6.23	—	—	—	—	15.45	38.86
	Minimum	1.544	0.063	0.575	0.087	0.016	3.978	—	—	—	—	14.97	38.22
	Maximum	17.93	0.099	1.413	0.196	0.042	6.503	—	—	—	—	16.98	41.6
	Std. dev.	5.286	0.011	0.332	0.031	0.009	0.959	—	—	—	—	0.692	1.245
	N obs.	12	12	12	12	12	6	0	0	0	0	6	6
2. Side channel	Mean	2.533	0.075	1.018	0.128	0.03	5.289	—	—	—	—	14.01	39.88
	Median	1.979	0.071	0.816	0.126	0.031	5.272	—	—	—	—	14.13	38.54
	Minimum	1.339	0.04	0.427	0.089	0.018	4.034	—	—	—	—	11.45	35.85
	Maximum	12.12	0.109	1.524	0.182	0.051	6.165	—	—	—	—	15.87	44.5
	Std. dev.	2.417	0.022	0.376	0.029	0.01	0.811	—	—	—	—	1.22	3.375
	N obs.	18	18	18	18	18	8	0	0	0	0	8	8
3. Backwater	Mean	2.147	0.054	0.621	0.118	0.032	4.836	—	—	—	—	15.73	37.48
	Median	1.569	0.043	0.537	0.109	0.033	4.922	—	—	—	—	15.75	36.75
	Minimum	0.939	0.03	0.21	0.072	-0.01	3.523	—	—	—	—	14.39	33.91
	Maximum	16.52	0.142	1.391	0.223	0.085	5.483	—	—	—	—	18.56	41.36
	Std. dev.	2.843	0.026	0.301	0.038	0.014	0.67	—	—	—	—	1.387	2.495
	N obs.	28	28	28	28	28	7	0	0	0	0	7	7
4. Lake	Mean	2.061	0.086	0.955	0.124	0.031	4.515	—	—	—	—	16.16	39.45
	Median	1.862	0.084	0.836	0.124	0.029	4.108	—	—	—	—	14.28	36.86
	Minimum	1.584	-0.02	0.753	0.108	0.016	4.108	—	—	—	—	14.28	36.86
	Maximum	4.781	0.137	1.41	0.144	0.054	4.922	—	—	—	—	18.04	42.05
	Std. dev.	0.731	0.029	0.233	0.01	0.01	0.576	—	—	—	—	2.659	3.668
	N obs.	17	17	17	16	17	2	0	0	0	0	2	2

Table F-2. Continued.

Sampling stratum	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1996 Near-surface measurements: winter							
1. Main channel	Mean	2.513	0.295	1.533	0.114	0.043	—	—	—	—	—	—	—
	Median	2.606	0.308	1.483	0.119	0.042	—	—	—	—	—	—	—
	Minimum	2.081	0.218	1.42	0.071	0.036	—	—	—	—	—	—	—
	Maximum	2.77	0.38	1.772	0.132	0.051	—	—	—	—	—	—	—
	Std. dev.	0.191	0.051	0.121	0.018	0.004	—	—	—	—	—	—	—
	N obs.	13	13	13	13	13	0	0	0	0	0	0	0
2. Side channel	Mean	2.48	0.259	1.503	0.108	0.041	—	—	—	—	—	—	—
	Median	2.423	0.249	1.482	0.101	0.038	—	—	—	—	—	—	—
	Minimum	2.198	0.195	1.283	0.065	0.027	—	—	—	—	—	—	—
	Maximum	2.916	0.34	1.724	0.223	0.057	—	—	—	—	—	—	—
	Std. dev.	0.184	0.045	0.16	0.033	0.009	—	—	—	—	—	—	—
	N obs.	18	18	18	18	18	0	0	0	0	0	0	0
3. Backwater	Mean	2.47	0.29	1.503	0.108	0.041	—	—	—	—	—	—	—
	Median	2.449	0.277	1.464	0.108	0.038	—	—	—	—	—	—	—
	Minimum	1.859	0.201	0.923	0.051	-0.01	—	—	—	—	—	—	—
	Maximum	2.829	0.594	1.801	0.185	0.102	—	—	—	—	—	—	—
	Std. dev.	0.27	0.098	0.235	0.029	0.02	—	—	—	—	—	—	—
	N obs.	19	19	19	19	19	0	0	0	0	0	0	0
4. Lake	Mean	2.594	0.282	1.65	0.118	0.05	—	—	—	—	—	—	—
	Median	2.637	0.294	1.667	0.12	0.05	—	—	—	—	—	—	—
	Minimum	2.214	0.043	1.296	0.039	-0.01	—	—	—	—	—	—	—
	Maximum	2.837	0.344	1.969	0.141	0.116	—	—	—	—	—	—	—
	Std. dev.	0.16	0.065	0.173	0.022	0.021	—	—	—	—	—	—	—
	N obs.	17	17	17	17	17	0	0	0	0	0	0	0
						1996 Near-surface measurements: spring							
1. Main channel	Mean	1.428	—	0.514	0.089	0.044	—	—	—	—	—	—	—
	Median	1.419	—	0.566	0.087	0.044	—	—	—	—	—	—	—
	Minimum	0.827	—	0.304	0.046	0.036	—	—	—	—	—	—	—
	Maximum	1.93	—	0.622	0.123	0.052	—	—	—	—	—	—	—
	Std. dev.	0.325	—	0.111	0.027	0.005	—	—	—	—	—	—	—
	N obs.	12	0	12	12	12	0	0	0	0	0	0	0

Table F-2. Continued.

Sampling stratum	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
1996 Near-surface measurements: spring													
2. Side channel	Mean	1.735	—	0.547	0.092	0.042	—	—	—	—	—	—	—
	Median	1.43	—	0.534	0.093	0.041	—	—	—	—	—	—	—
	Minimum	-0.1	—	0.256	0.057	0.035	—	—	—	—	—	—	—
	Maximum	8.27	—	0.883	0.147	0.054	—	—	—	—	—	—	—
	Std. dev.	1.63	—	0.128	0.023	0.005	—	—	—	—	—	—	—
	N obs.	19	0	19	19	19	0	0	0	0	0	0	0
3. Backwater	Mean	1.62	—	0.488	0.09	0.043	—	—	—	—	—	—	—
	Median	1.516	—	0.48	0.083	0.043	—	—	—	—	—	—	—
	Minimum	0.826	—	0.221	0.041	0.035	—	—	—	—	—	—	—
	Maximum	4.656	—	0.648	0.157	0.055	—	—	—	—	—	—	—
	Std. dev.	0.685	—	0.093	0.026	0.006	—	—	—	—	—	—	—
	N obs.	26	0	26	26	26	0	0	0	0	0	0	0
4. Lake	Mean	1.607	—	0.472	0.081	0.038	—	—	—	—	—	—	—
	Median	1.469	—	0.469	0.071	0.037	—	—	—	—	—	—	—
	Minimum	0.821	—	0.4	0.049	0.034	—	—	—	—	—	—	—
	Maximum	3.721	—	0.547	0.169	0.042	—	—	—	—	—	—	—
	Std. dev.	0.613	—	0.038	0.031	0.002	—	—	—	—	—	—	—
	N obs.	16	0	16	16	16	0	0	0	0	0	0	0
1996 Near-surface measurements: summer													
1. Main channel	Mean	1.884	0.044	1.05	0.149	0.038	—	—	—	—	—	—	—
	Median	1.78	-0.02	1.09	0.147	0.031	—	—	—	—	—	—	—
	Minimum	0.864	-0.02	0.33	0.095	-0.01	—	—	—	—	—	—	—
	Maximum	3.347	0.169	1.439	0.204	0.091	—	—	—	—	—	—	—
	Std. dev.	0.572	0.052	0.273	0.031	0.027	—	—	—	—	—	—	—
	N obs.	15	15	15	12	15	0	0	0	0	0	0	0
2. Side channel	Mean	1.588	0.027	0.837	0.155	0.03	—	—	—	—	—	—	—
	Median	1.592	0.02	0.835	0.15	0.033	—	—	—	—	—	—	—
	Minimum	1.109	-0.02	0.298	0.094	-0.01	—	—	—	—	—	—	—
	Maximum	1.949	0.086	1.218	0.215	0.07	—	—	—	—	—	—	—
	Std. dev.	0.308	0.023	0.284	0.035	0.018	—	—	—	—	—	—	—
	N obs.	16	16	16	10	16	0	0	0	0	0	0	0

Table F-2. Continued.

Sampling stratum	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1996 Near-surface measurements: summer							
3. Backwater	Mean	1.611	0.045	0.652	0.193	0.031	—	—	—	—	—	—	—
	Median	1.825	0.029	0.558	0.172	0.025	—	—	—	—	—	—	—
	Minimum	0.229	-0.02	-0.01	0.114	-0.01	—	—	—	—	—	—	—
	Maximum	2.948	0.178	1.344	0.402	0.071	—	—	—	—	—	—	—
	Std. dev.	0.524	0.045	0.379	0.062	0.021	—	—	—	—	—	—	—
	N obs.	29	29	29	22	28	0	0	0	0	0	0	0
4. Lake	Mean	1.999	0.076	1.216	0.161	0.041	—	—	—	—	—	—	—
	Median	1.966	0.074	1.277	0.151	0.032	—	—	—	—	—	—	—
	Minimum	1.706	-0.02	0.599	0.134	-0.01	—	—	—	—	—	—	—
	Maximum	2.392	0.15	1.517	0.238	0.092	—	—	—	—	—	—	—
	Std. dev.	0.203	0.048	0.214	0.027	0.023	—	—	—	—	—	—	—
	N obs.	16	16	16	12	16	0	0	0	0	0	0	0
						1996 Near-surface measurements: fall							
1. Main channel	Mean	1.49	0.026	0.708	—	0.012	—	—	—	—	—	—	—
	Median	1.381	0.021	0.673	—	0.011	—	—	—	—	—	—	—
	Minimum	1.203	-0.02	0.486	—	-0.01	—	—	—	—	—	—	—
	Maximum	1.827	0.1	0.913	—	0.025	—	—	—	—	—	—	—
	Std. dev.	0.225	0.025	0.161	—	0.007	—	—	—	—	—	—	—
	N obs.	13	13	13	0	13	0	0	0	0	0	0	0
2. Side channel	Mean	1.674	0.034	0.698	—	0.021	—	—	—	—	—	—	—
	Median	1.542	-0.02	0.684	—	0.017	—	—	—	—	—	—	—
	Minimum	1.244	-0.02	0.325	—	-0.01	—	—	—	—	—	—	—
	Maximum	3.067	0.087	0.972	—	0.037	—	—	—	—	—	—	—
	Std. dev.	0.479	0.031	0.151	—	0.01	—	—	—	—	—	—	—
	N obs.	16	16	16	0	16	0	0	0	0	0	0	0
3. Backwater	Mean	1.345	0.026	0.528	—	0.011	—	—	—	—	—	—	—
	Median	1.303	-0.02	0.478	—	-0.01	—	—	—	—	—	—	—
	Minimum	0.93	-0.02	-0.01	—	-0.01	—	—	—	—	—	—	—
	Maximum	1.798	0.143	1.042	—	0.03	—	—	—	—	—	—	—
	Std. dev.	0.278	0.03	0.253	—	0.008	—	—	—	—	—	—	—
	N obs.	28	28	28	0	28	0	0	0	0	0	0	0

Table F-2. Continued.

Sampling stratum	Statistic	Total nitrogen (N mg/L)	Ammonium (N mg/L)	Nitrate–nitrite (N mg/L)	Total phosphorus (P mg/L)	Soluble reactive P (P mg/L)	Silica (Si mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulfate (mg/L)
						1996 Near-surface measurements: fall							
4. Lake	Mean	1.644	0.03	0.741	—	0.016	—	—	—	—	—	—	—
	Median	1.616	0.025	0.74	—	0.013	—	—	—	—	—	—	—
	Minimum	1.4	-0.02	0.645	—	-0.01	—	—	—	—	—	—	—
	Maximum	1.937	0.082	0.815	—	0.04	—	—	—	—	—	—	—
	Std. dev.	0.159	0.02	0.056	—	0.01	—	—	—	—	—	—	—
	N obs.	16	16	16	0	16	0	0	0	0	0	0	0

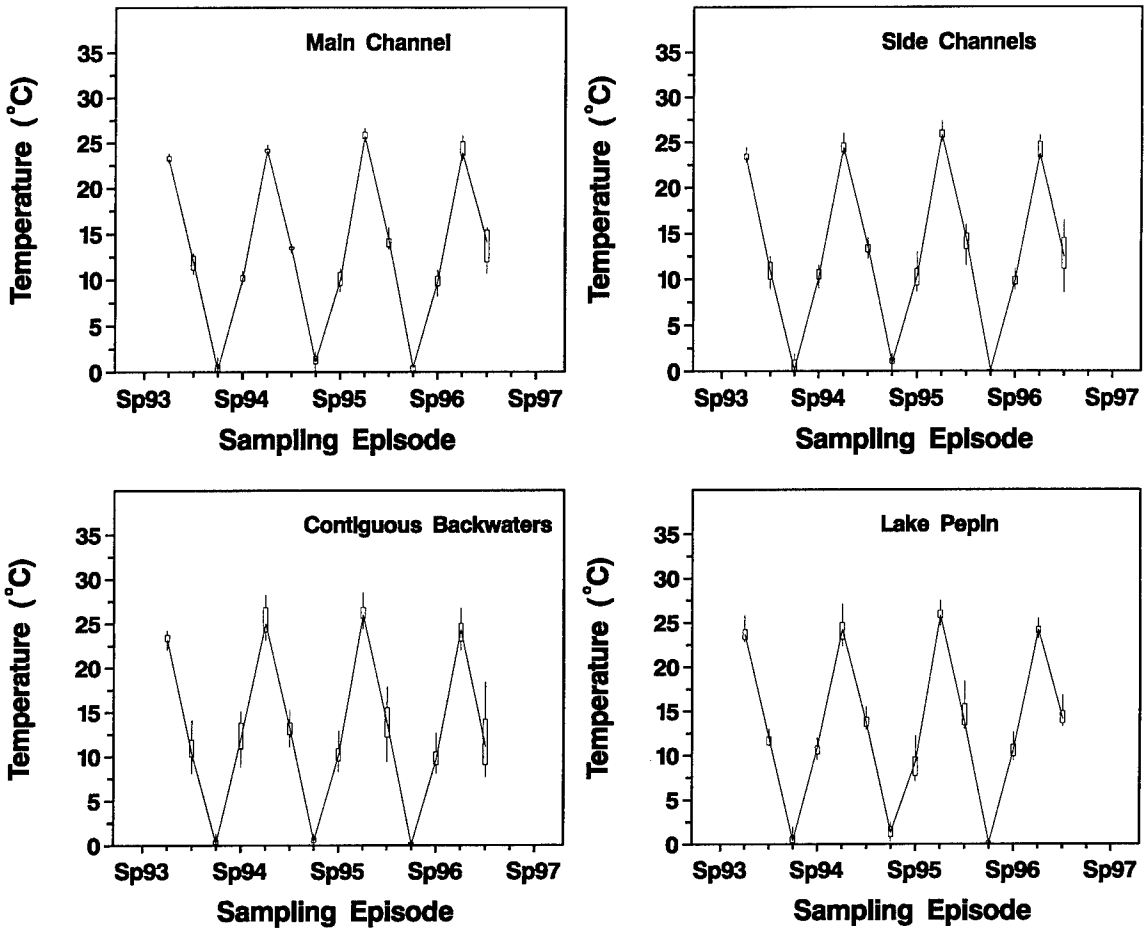

Figure F-1. Water temperature (°C) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

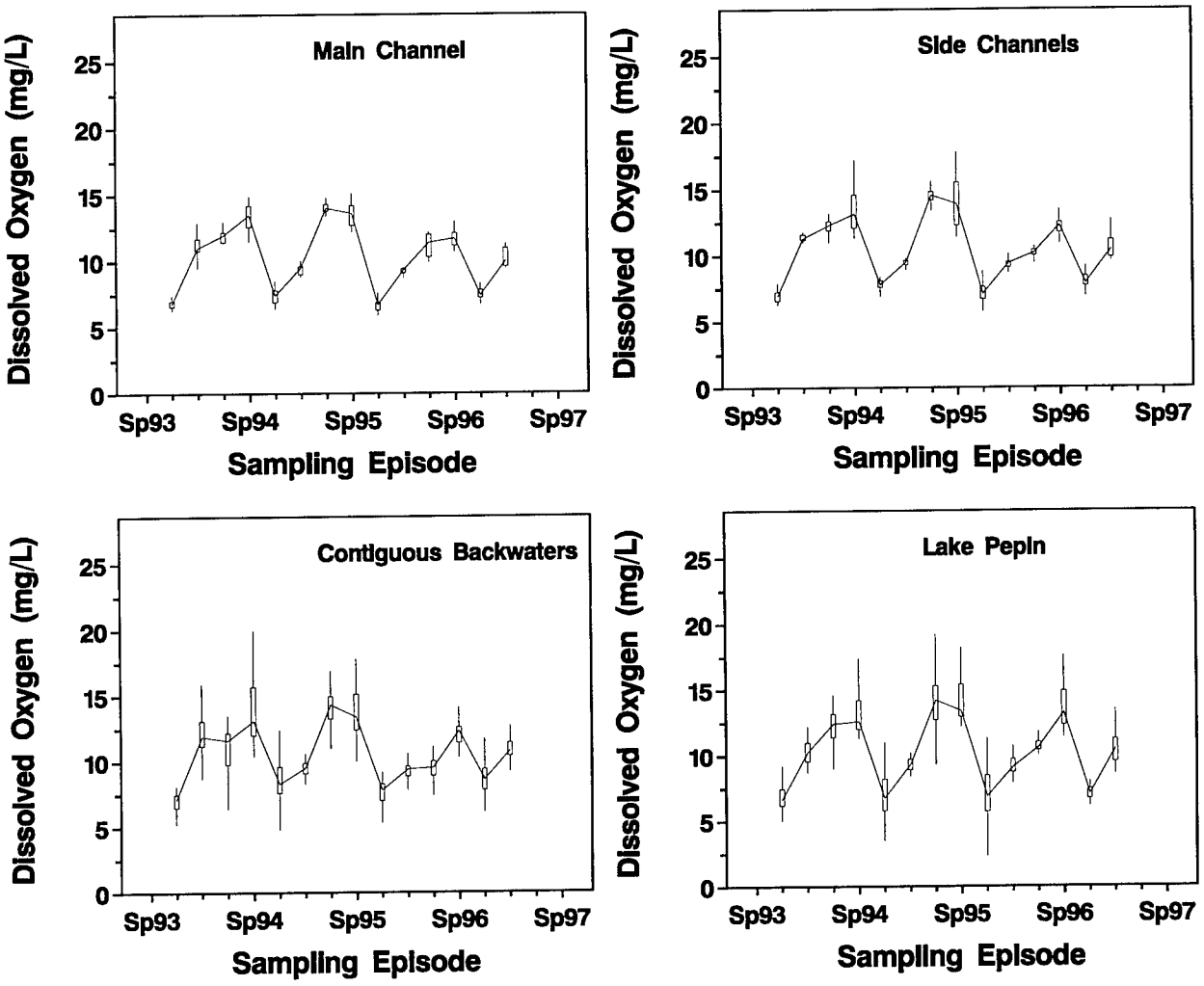

Figure F-2. Dissolved oxygen (mg/L) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

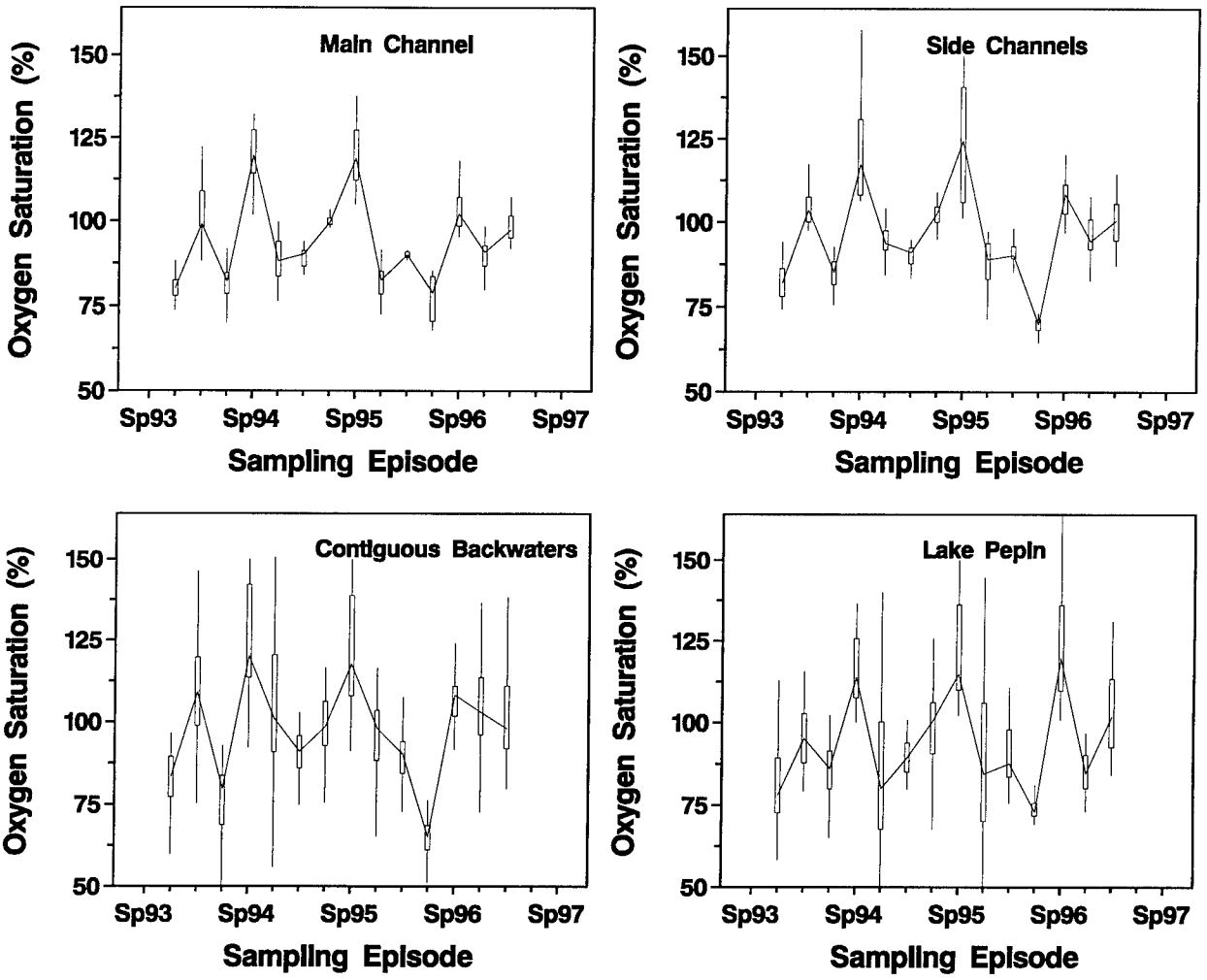

Figure F-3. Dissolved oxygen saturation (%) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

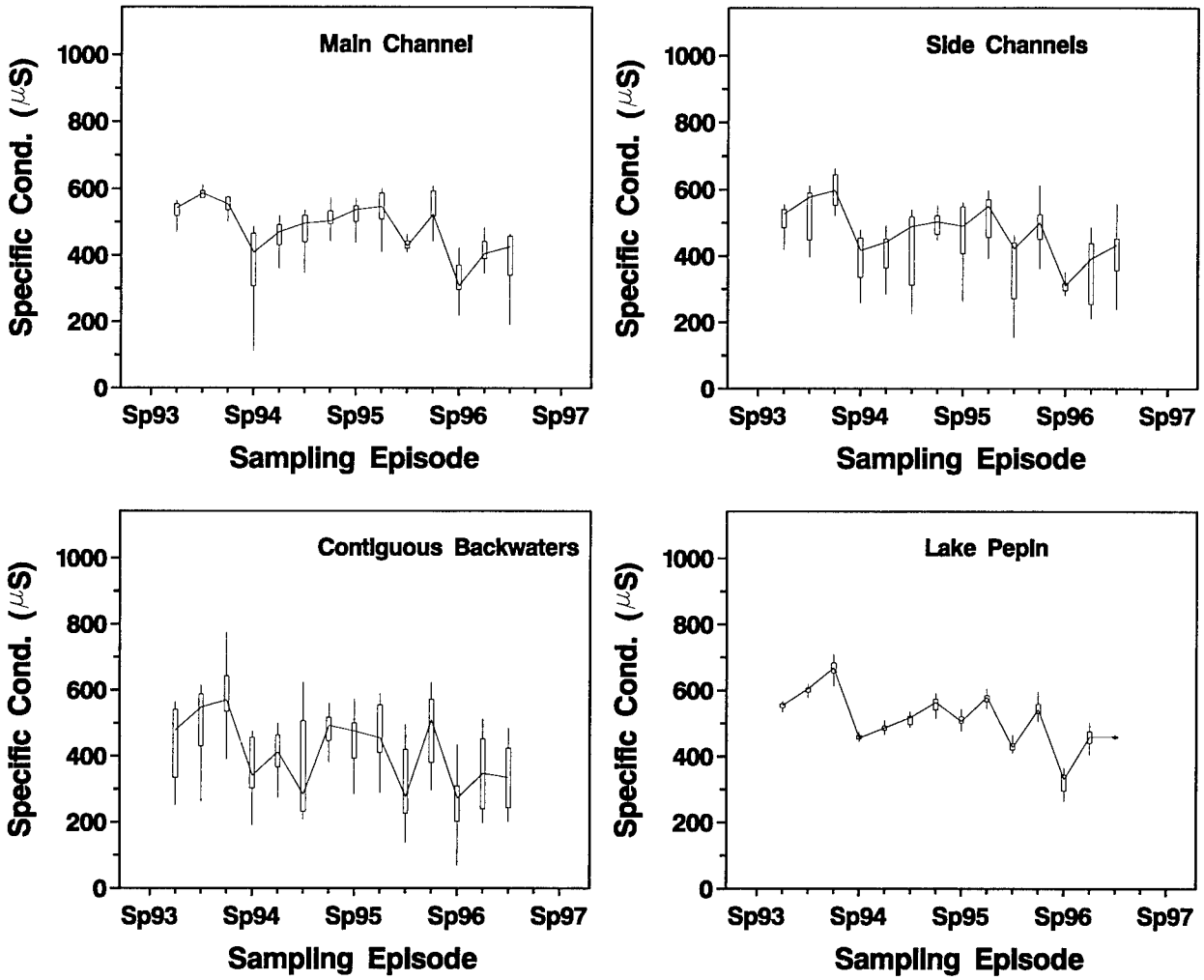

Figure F-4. Specfic conductivity (μS) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

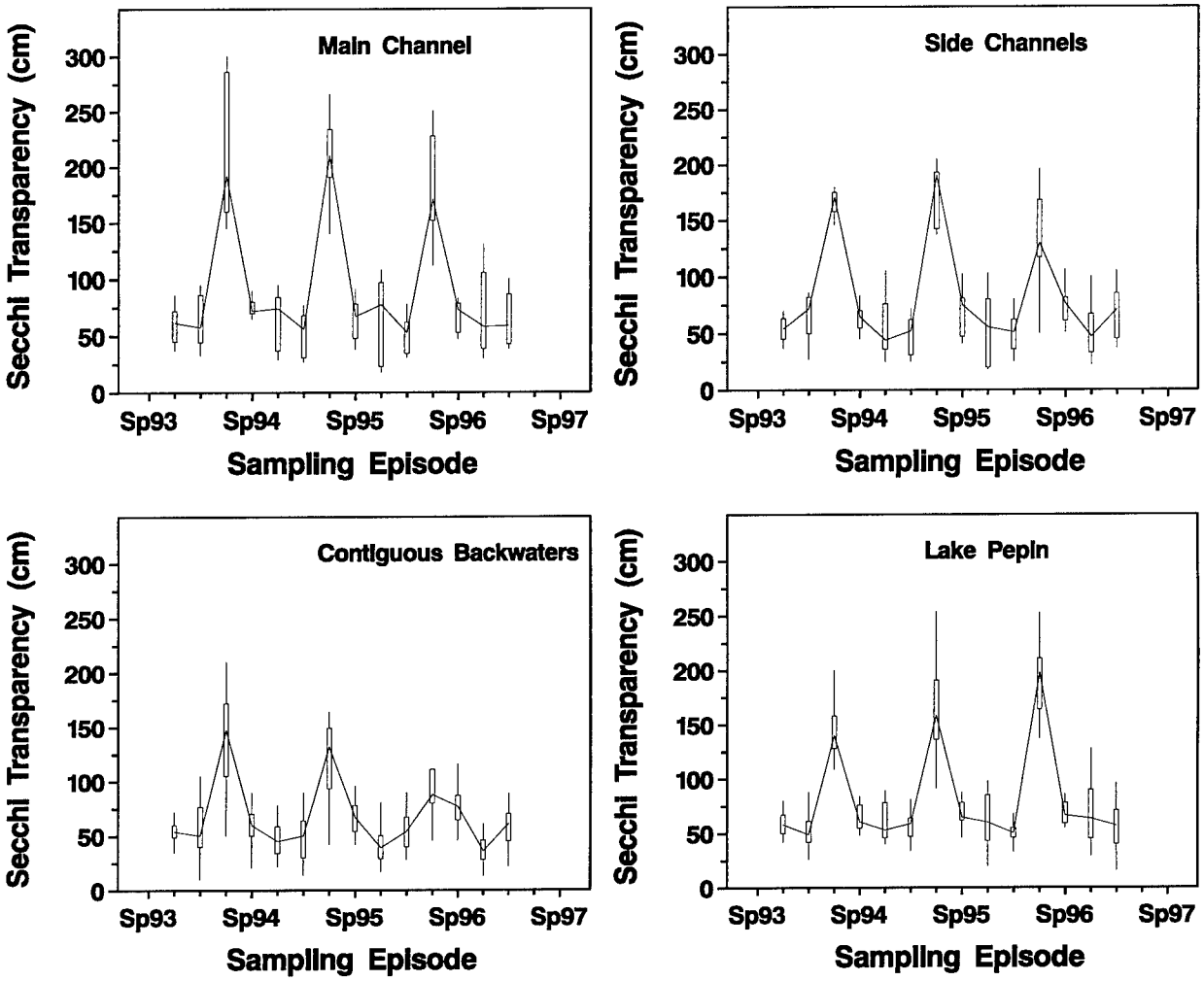

Figure F-5. Secchi disk transparency (cm) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

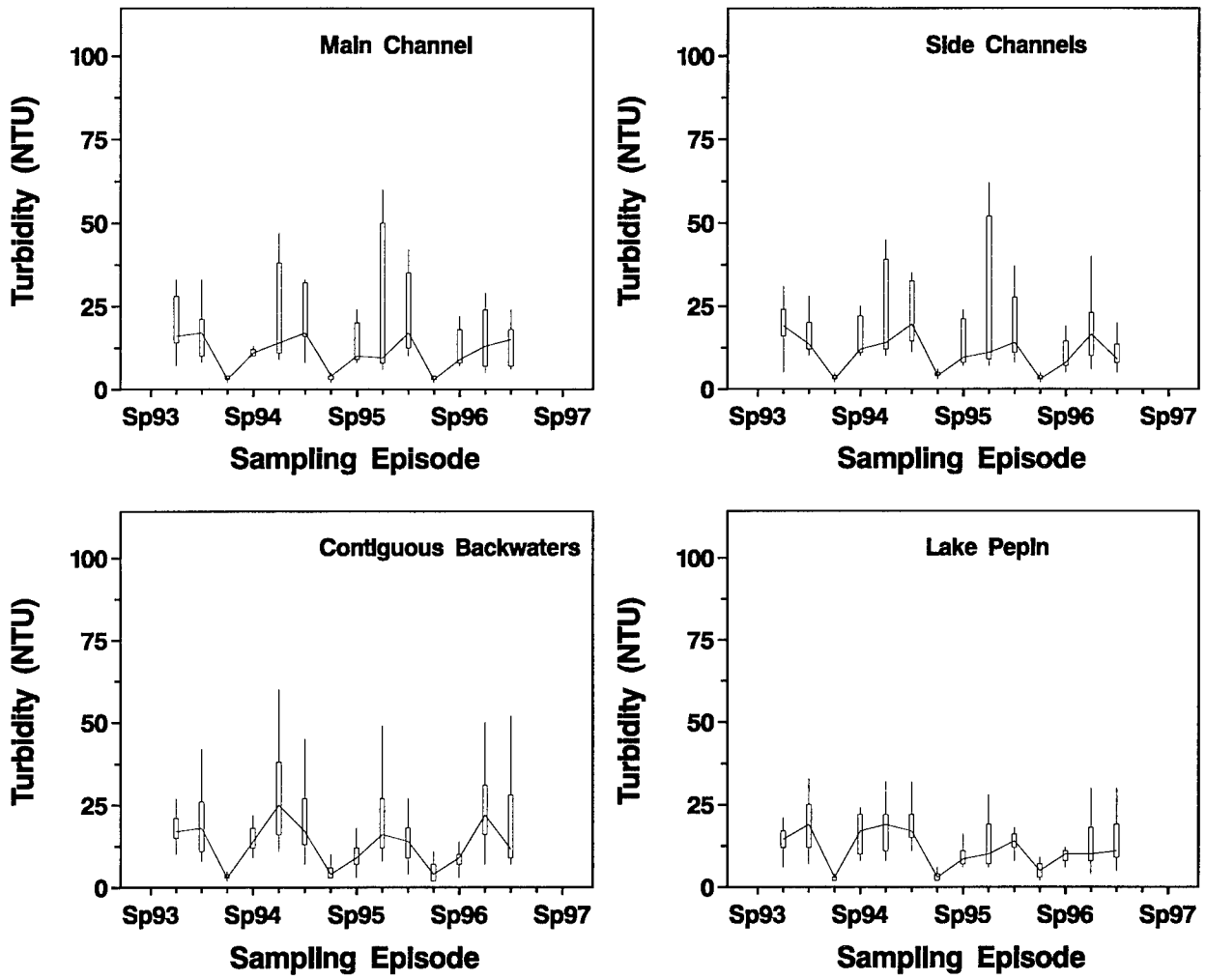

Figure F-6. Turbidity (NTU) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

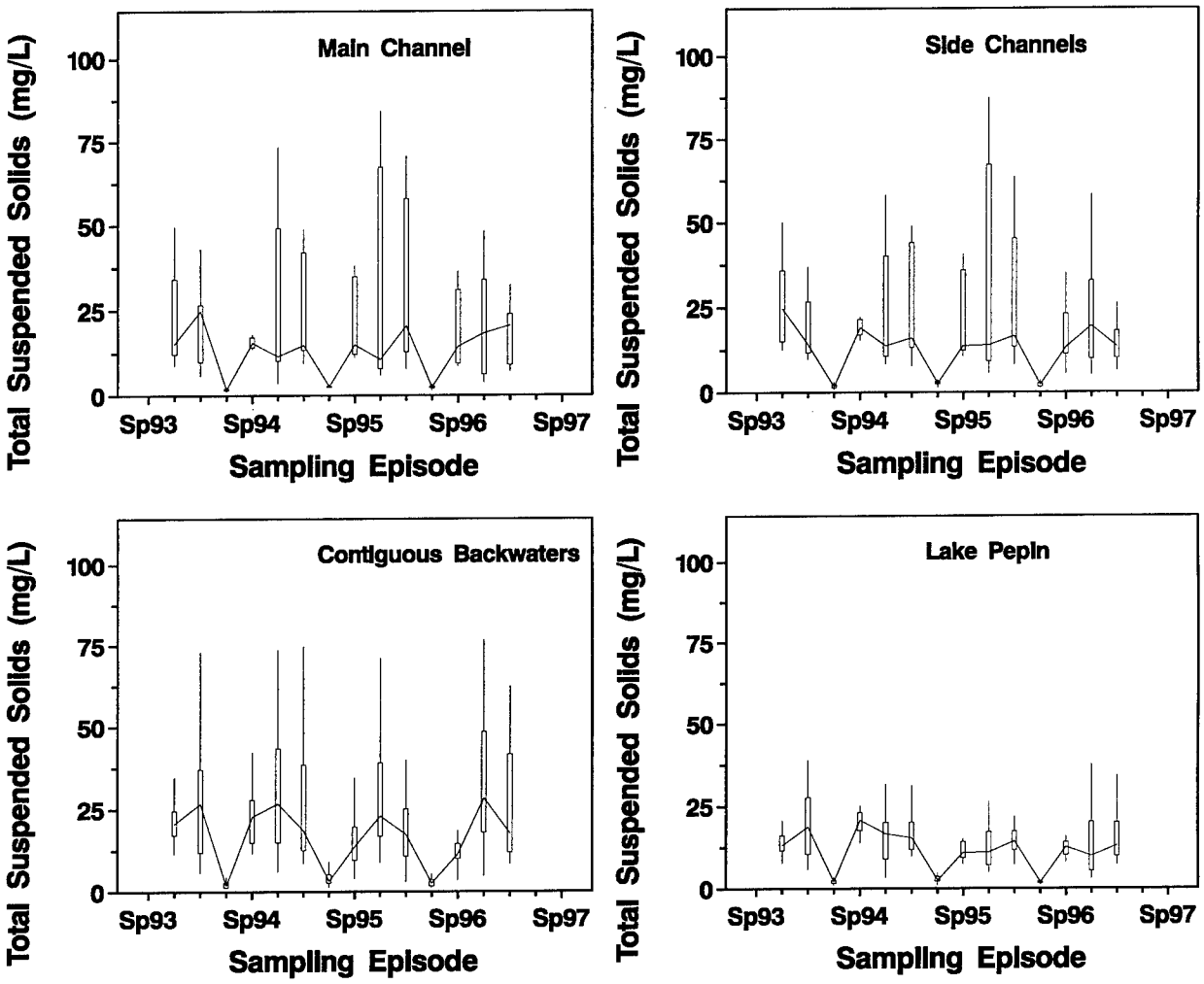

Figure F-7. Total suspended solids (mg/L) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

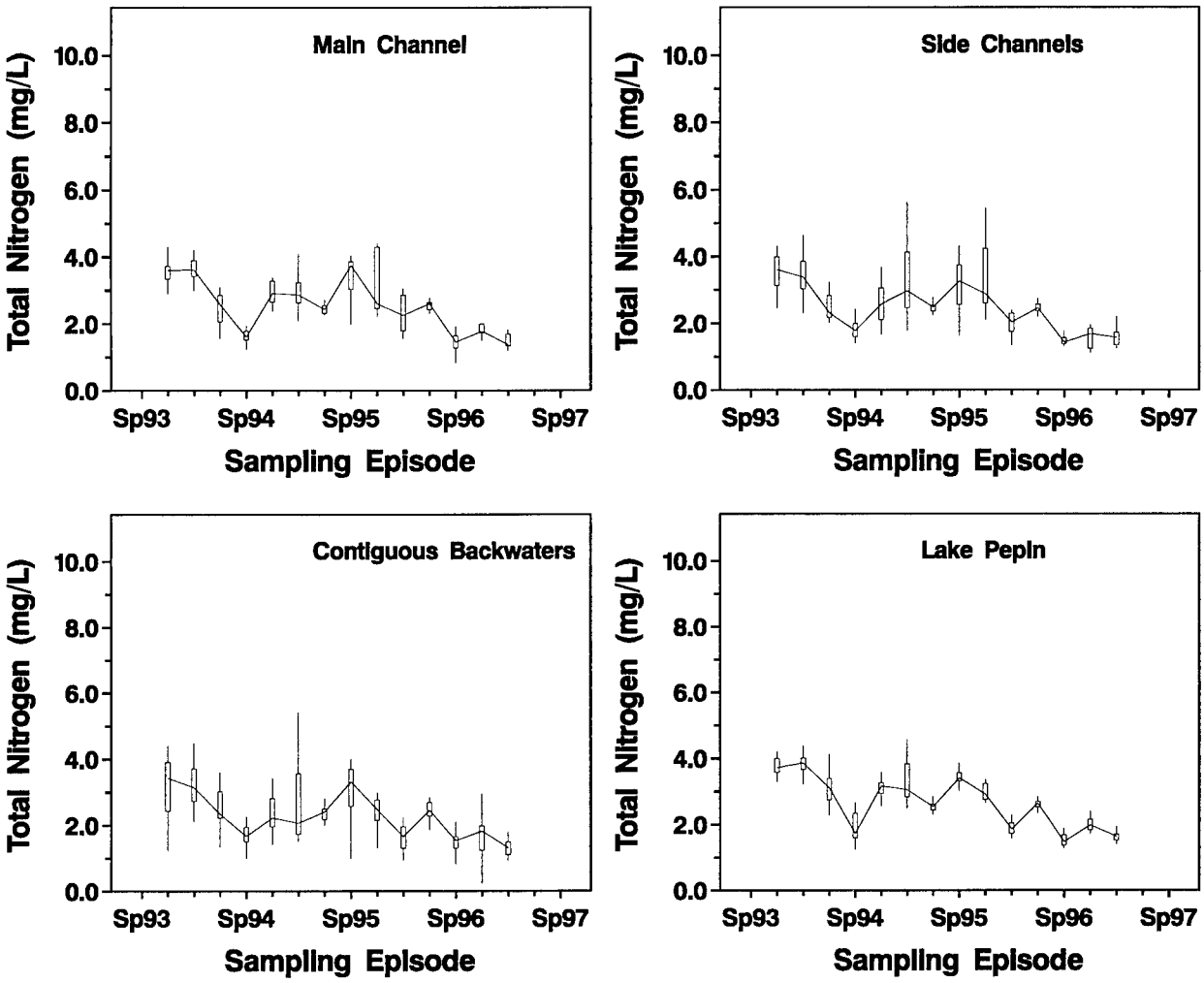

Figure F-8. Total nitrogen (mg/L) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

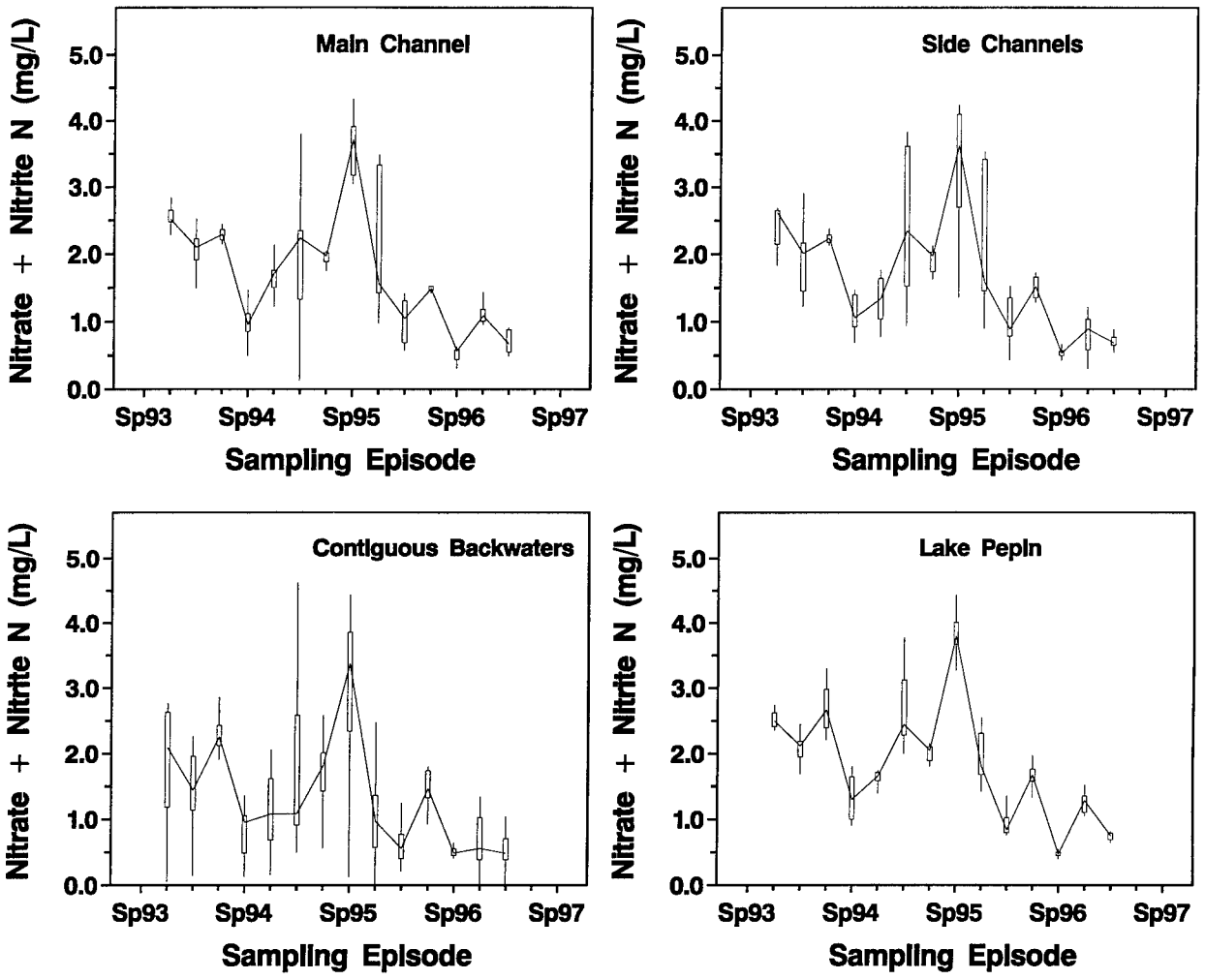

Figure F-9. Nitrate–nitrite nitrogen (mg/L) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

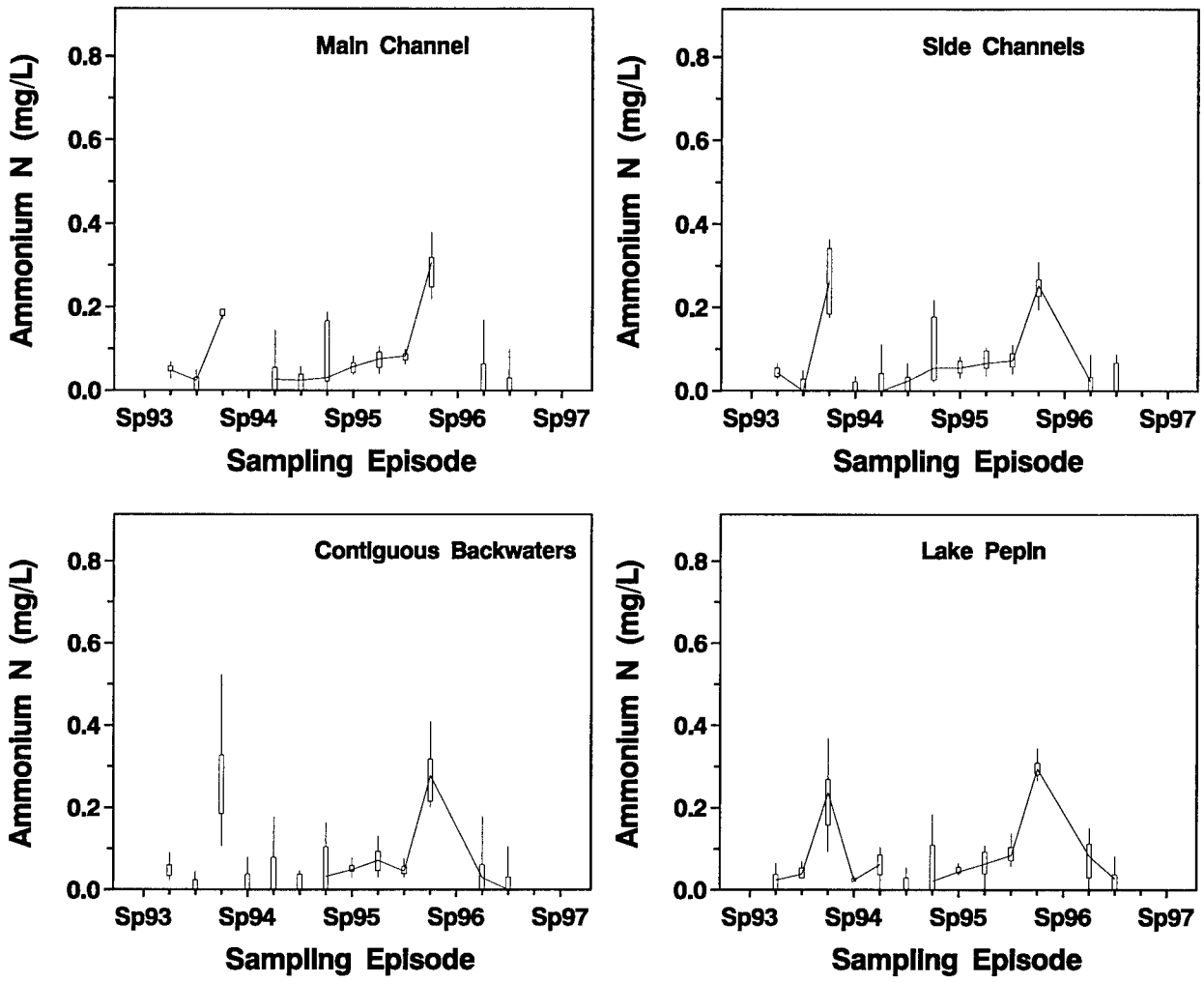

Figure F-10. Ammonium nitrogen (mg/L) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

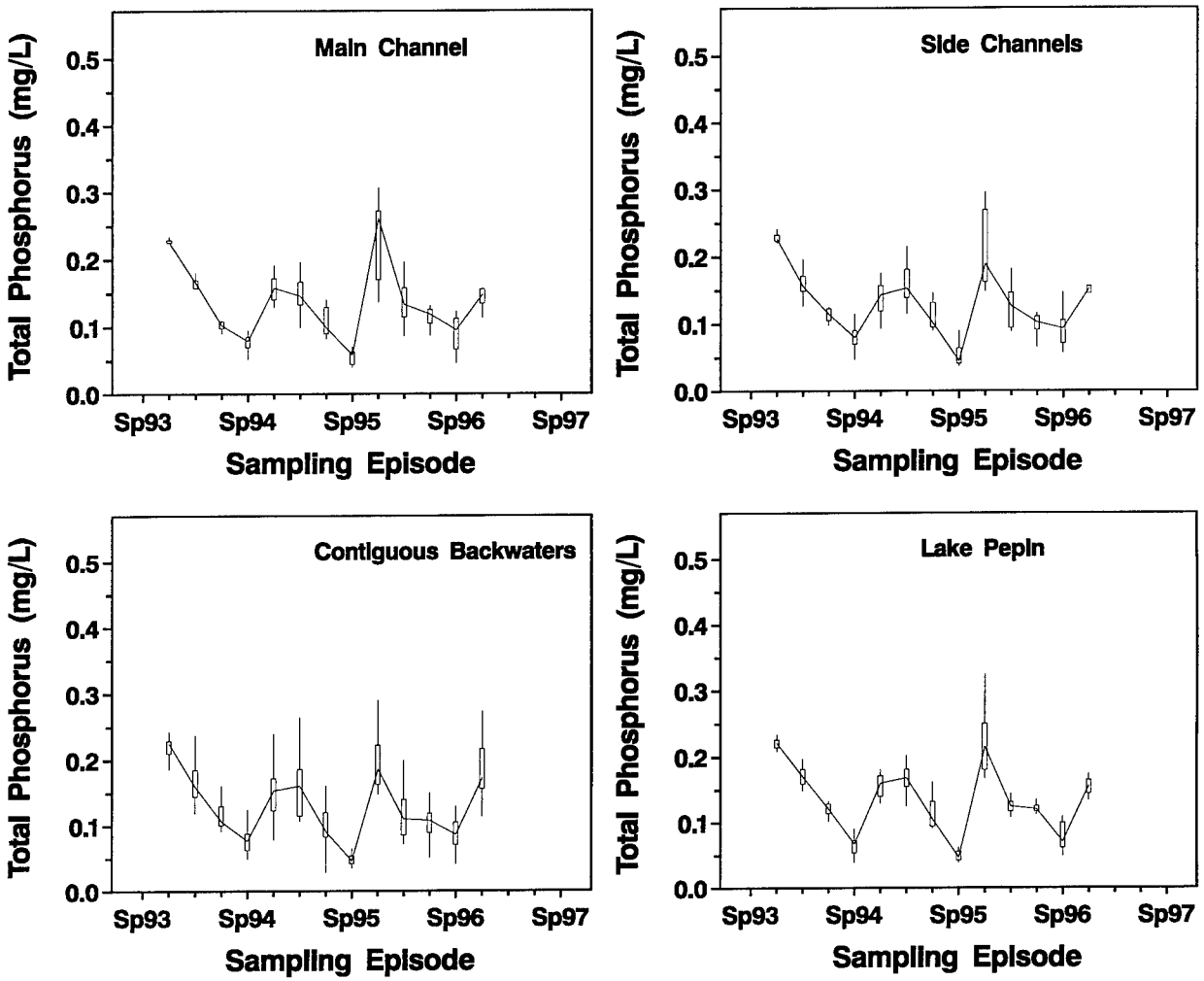

Figure F-11. Total phosphorus (mg/L) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

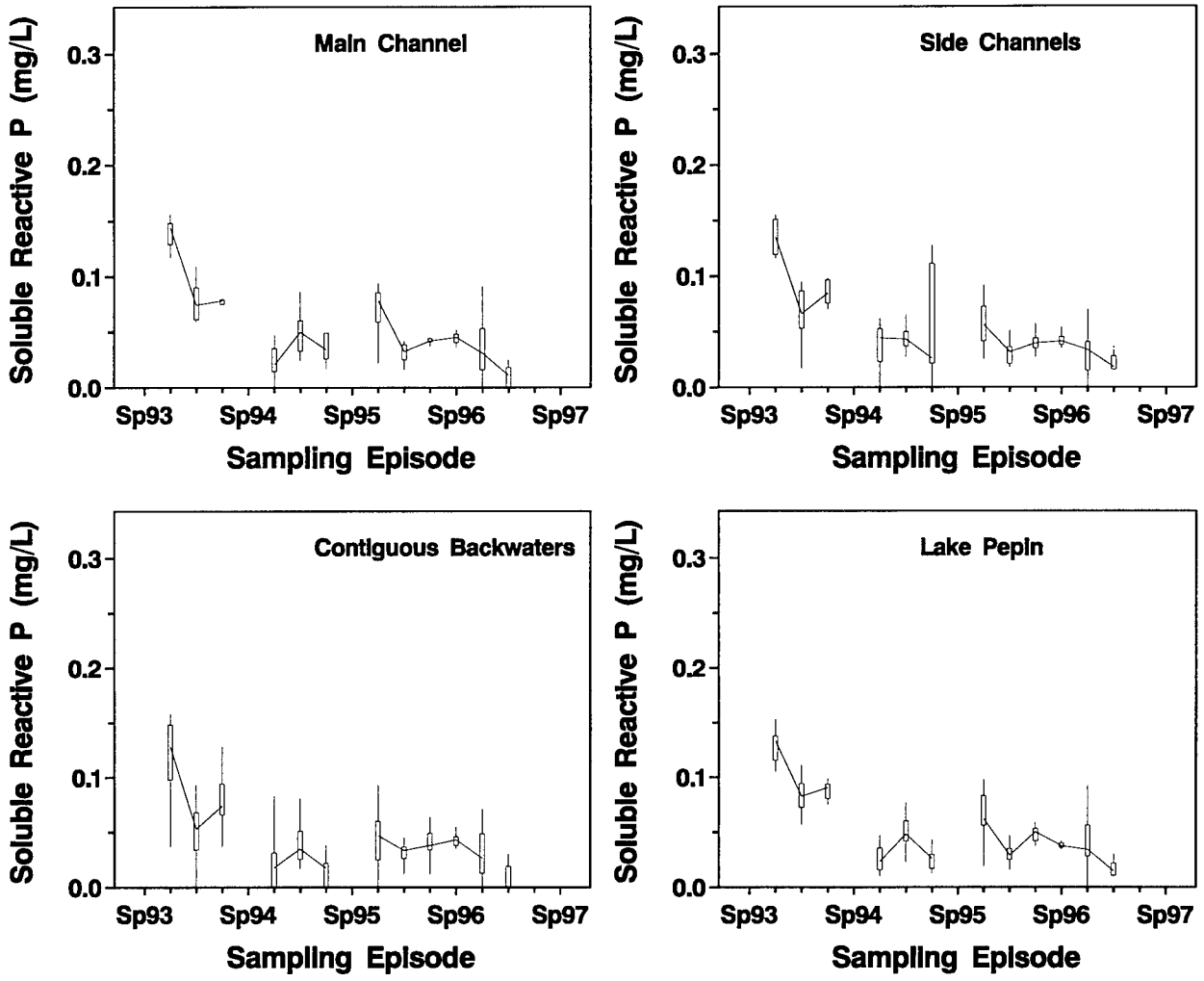

Figure F-12 Soluble reactive phosphorus (mg/L) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

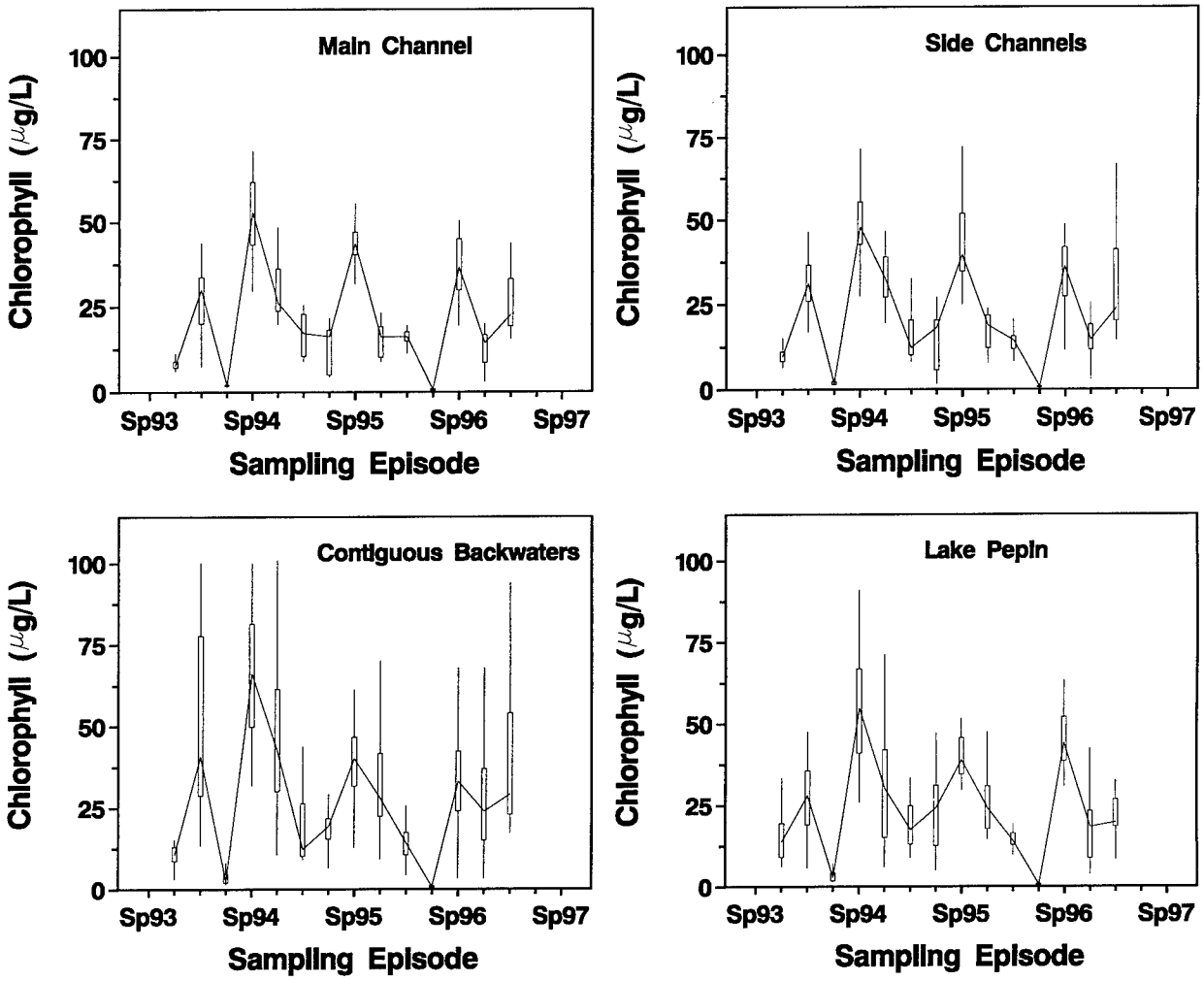

Figure F-13. Fluorometric chlorophyll *a* (µg/L) in stratified random sampling episodes from spring 1993 (Sp93) through fall 1996. Each sampling stratum is plotted separately. A solid line connects the medians of each episode, the 90th and 10th percentiles of the data are shown by the upper and lower extent of the box, and vertical lines extend to the maximum and minimum values (or to the limits of the plotting axis).

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13. ABSTRACT (Maximum 200 words) Since 1988, the Long Term Resource Monitoring Program (LTRMP) has performed basic limnological field measurements in the Upper Mississippi River System. The period of this report (1993–96) includes a major revision of the LTRMP sampling design in 1993 that added randomization, broader spatial coverage, and increased monitoring of tributaries and locations that allow monitoring of material transport. Monitoring by the Lake City Field Station reported here shows water quality differences among the tributaries to Pools 4 and 5, spatial and temporal patterns within these pools, and the sediment and nutrient trapping effects of Lake Pepin, a natural impoundment of the Mississippi River.			
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